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THE

RETROSPECT OF MEDICINE:

BEING

A HALF-YEARLY JOURNAL

CONTAINING A RETROSPECTIVE VIEW OF EVERY DISCOVERY AND PRACTICAL IMPROVEMENT IN THE MEDICAL SCIENCES.

EDITED BY

W. BRAITHWAITE, M.D.

LATE LECTURER ON MIDWIFERY AND THE DISEASES OF WOMEN AND CHILDREN AT THE LEEDS SCHOOL OF MEDICINE, ETC.

AND

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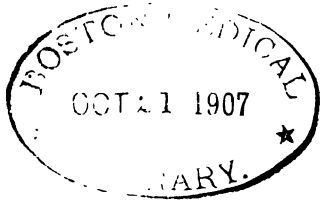

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SYNOPSIS.

AN ABSTRACT OF THE MOST PRACTICAL ARTICLES IN THIS VOLUME, WITH OTHER SHORT ARTICLES FROM THE MEDICAL JOURNALS, SHOWING THE MOST IMPORTANT INDICATIONS OF TREATMENT PUBLISHED BY DIFFERENT WRITERS DURING THE HALF-YEAR, ARRANGED ALPHABETICALLY.

AFFECTIONS OF THE SYSTEM GENERALLY.

BRONCHOCELE.—*The Seton.*—In two cases of this kind at King's College Hospital, the following plan of treatment was successfully adopted. The tumour was punctured with a small trocar and a considerable quantity of blood was emitted. A needle armed with a double hempen thread was passed through the opening, carried deeply into the substance of the swelling, and brought out on the opposite side, the threads were tied together and left to act as a seton: considerable local irritation was produced, accompanied with free purulent discharge, and at the end of two weeks the patient suffered from a good deal of febrile disturbance, and the seton was withdrawn. A drainage-tube was passed into one of the openings, and through this much discharge of offensive débris took place, the tumour gradually diminished in size, and the man left the hospital after several weeks, still wearing the drainage-tube. He presented himself from time to time until the tube was taken out altogether. When exhibited to the students there was no appearance of the tumour beyond a very slight thickening, and the man was in perfect health, the neck measuring only fifteen inches and a half. The second case was that of a woman aged 68, who had suffered from bronchocele for sixteen years, for which she entered the hospital in Nov. 1882. The tumour was even considerably larger than that of the man, involving the whole of the gland, and producing so much distress that the patient could not lie down in consequence of the dyspnœa which was occasioned, and which had become greatly increased during the last few weeks. As it was necessary to do something, and excision was out of the question in such an aged and unhealthy subject, Mr. Smith introduced a double thread across the tumour and retained it. Comparatively little irritation was produced,

but there was a free discharge, and consequently the seton was retained for a period of sixteen weeks, when it was removed. Free discharge of purulent matter and débris continued, the tumour rapidly decreased in size, the difficulty of breathing and distress entirely left her, and when examined at the hospital there was no more trace of the growth than in the instance of the man. (Mr. H. Smith, Lancet, Jan. 5, p. 12.)

CHRONIC RHEUMATISM OF ELBOW AND KNEE-JOINTS, AND SCIATICA.—*Menthol.*—In the pains of chronic rheumatism of elbow and knee-joints the application of the following mixture affords prompt relief, and in my own case of sciatica, rubbed down the groin and thigh, it acted like a charm. ℞. Menthol. ʒ j.; alcohol. ℥ j.; olei caryophylli, olei cinnam., aa ℥ xx. M. (Dr. F. O. Lockwood, Therapeutic Gazette, Oct. 1883.)

DISINFECTION BY HEAT.—In seeking to disinfect by heat, that heat should be carried as high, and continued as long as is possible, or necessary, to ensure the destruction of infective matter; subject only to the limit that infected clothing or other articles operated upon may not be injured or destroyed. And in determining the practical limit that is expedient, I have to make honourable mention of Dr. W. Henry, who made practical trials 50 years ago on fabrics of clothing and other articles, which have left little save gleanings for subsequent observers. His observations show that exposure in dry heated air to a temperature of 220° to 230° for one or two hours is sufficient for disinfecting purposes, does not injure the integrity or the appearance of ordinary clothing and bedding, but that a temperature of 250° is risky, may cause injury, and is therefore unnecessary. In considering the practical application of heat to infective matter for disinfecting purposes we need not take into account the exceptional laboratory experiences of various observers who have recorded extraordinary degrees of heat withstood by some germs. These are little likely to be noticed in future now that Tyndall has specified so clearly the conditions under which they are likely to have occurred. These rare instances are matters of curious interest, more for the naturalist than for the sanitary physician. The general evidence now accumulated is abundantly sufficient to warrant the conclusions recently laid down by Pasteur and Leon Colin in their report on disinfecting stoves made in 1880 to the Council of Health of Paris and the Seine. These are to the effect that while humid heat of 212° F. will certainly destroy all life in morbid germs, and all dangerous condition in virulent matter, a temperature be-

tween 212° and 230° F., whether dry or humid, may be fixed as sufficient for all practical purposes. A higher temperature is unneccessary. Any apparatus for disinfecting by heat is insufficient that does not make provision for detaining volatile contagious matter, and subjecting it to the same degree of heat, at least, and the same duration of exposure that is found practically necessary in dealing with infected clothing, bedding, and other objects. The alternate use of moist and of dry heat, or of both conjoined, is preferable to the use of dry heat exclusively. In disinfection by heat, the immediate and certain destruction of volatile contagious matter can only be ensured by passing such matter through the flames of a furnace. (Dr. James Adams, p. 151.)

ENTERIC FEVER.—*The Cold Bath Treatment.*—As to the rules, so far as it is possible to formulate any of the treatment, they may be summed up as follows:—The patient should be as lightly covered as possible, and whenever the temperature reaches 102° sponging should be practised; but if, as mostly happens, the pyrexia cannot be adequately controlled by this measure, then the bath treatment may at once be commenced. The temperature of the bath may be about 75° and the time of immersion ten minutes; but this may be varied, as already explained. If possible the bodily temperature should not be suffered to rise above 103° without having recourse to the bath; and if this entail the repetition of the bath more than every three hours sponging may be practised in the intervals, or quinine given after a bath. The treatment must not be abandoned, in the face of pulmonary complications, as bronchitis, congestion or pneumonia; but when necessity compels a resort to it in the later stages of the fever, and symptoms of grave intestinal lesion are present, caution should be practised in bathing, for which it is well often to substitute the application of compresses or cold sponging. If there be intestinal hemorrhage or signs of peritonitis, the bath must not be given. Although by aid of stimulants bathing may safely be practised when the pulse is rapid and feeble I should regard extreme debility, especially in old subjects, or the presence of organic heart disease, as distinct contra-indications for its employment. It is not prudent to relax rigid dietetic rules, although the patient, under the influence of the treatment, may have his digestive functions so improved as to create a craving for solids before actual defervescence sets in. (Dr. Sydney Coupland, p. 134.)

Cold Baths in Enteric Fever.—When any plan of treating disease is introduced on high authority, it is usually largely adopted, and finds many enthusiastic advocates. There is one reason

no doubt why the cold bath treatment should be an exception to the rule—namely, that it is difficult and expensive of application. Nevertheless I believe that it has been very largely adopted abroad, and even to no inconsiderable extent in our own country and in this metropolis. It was once much employed at St. Thomas's. Some of my colleagues were much more enamoured of it than myself, and some at any rate have written strongly in its favour, but for several years its use has only been exceptional. My impression is that it has been largely discontinued in most of the hospitals of London. The German gentleman whom I just now quoted assures me that its employment has almost died out in Austria, and some other parts of the continent; and that even in Prussia it is scarcely in use, excepting by two or three enthusiasts who have identified themselves and their reputation with it. If the view above expressed of the liability of the cold bath treatment to induce dangerous internal complications, and if its large discontinuance by those who formerly employed it be correct, they present strong arguments against its value as a curative agent. (Dr. J. S. Bristowe, p. 143.)

Modified Cold-Water Treatment of Typhoid Fever.—1. The thorough cold-water treatment of typhoid fever is based upon what appears to be a one-sided view of the process of fever. 2. The question is one which cannot be satisfactorily determined by statistics. 3. A general opinion has gradually developed, which, whatever statistics may appear to prove, cannot be disregarded against the indiscriminate use of bathing, and in favour of its use in appropriate cases. 4. While not denying that in hyperpyretic cases cold-bathing is the most valuable of the known methods of treatment, in the less severe cases it stands only on the same level as many other antipyretic remedies; and 5. The success of the treatment depends chiefly upon the clinical skill which recognises the proper circumstances for its use. (Dr. Samuel West, Medical Times and Gazette, March 8, p. 309.)

Cold Douche and Affusion in Fever.—I was sent for hurriedly to see, for the first time, a case of typhoid fever well on in its course—I found the patient unconscious, in a sort of convulsive tremor, with a temperature of 108°. Seeing that death was imminent, and believing that a cold bath would give him the only chance of life, I carried him to the bath-room. The bath was empty, but I laid him in and turned on the cold tap. Fearing that life might ebb before sufficient water could surround his body to make any difference to his temperature, I dashed cold water on his chest out of a tumbler. The first douche made him look up with intelli-

gence, and his symptoms had greatly improved before there was any quantity of water in the bath. Struck with the sudden improvement which the cold douche produced in this case, and having heard of Dr. Currie's treatment, I obtained his work on the treatment of fever by cold affusion. From its perusal I determined to adopt his practice; and the first case in which I had occasion to try it was that of a boy, to whom I was called early in the morning of the second day of scarlet fever. He had a livid rash, and was almost unconscious, with a pulse that could hardly be felt. Having stripped him naked, I set him into an empty tub, and poured a pailful of cold water over his shoulders. Though he was helpless enough when set into the tub, he got out without help, and was put into bed among blankets. To my astonishment, his pulse, immediately after the water had been used, was full and about 120, and he was quite intelligent. His skin became moist, and he slept. The sudden change in the pulse and the intellect astonished me, but the perspiration, in such a case of scarlet fever, on the second day of its course, was to me the most remarkable of the effects of a single cold affusion. The temperature was reduced only one degree. The boy asked to have the affusion repeated, and his mother continued the treatment herself. For this treatment nothing is required except a tub and a pail of water, and I found adults in typhoid fever as fond of the treatment as was the scarlet fever boy. The effect of cold affusion in fever convinced me that the temperature is by no means the most important symptom in fevers, and I was confirmed in this belief by the record of the case of a young lady who, from some spinal injury, had a continuous temperature of 122°, without any disturbance of the digestive or other organs, showing, in fact, none of those symptoms for which the pyrexial state has been blamed. We may presume that putting a patient suddenly into cold water will have the same effect as putting the cold water suddenly on him. I have shown how beneficial cold affusion is, and I believe hot affusion would have exactly the same effect, judging from their almost identical effect on a healthy person. Is it not possible, nay very probable, that the good effect of a cold bath is in the sudden shock which immersion gives to the system, and that the bad effect is produced by the continued immersion? This seems a question well worthy of being inquired into, and, if found to be true, then we should do well to return to the practice of cold affusion in the treatment of fevers, as advocated by Dr. Currie, of Liverpool, and used with success by Edinburgh physicians at the beginning of this century. (Dr. John Haddon, p. 145.)

RHEUMATIC FEVER.—*Salicylate of Soda.*—By giving doses of 25 or 30 grains every two hours the disease may be got under control in twenty-four hours, or in more severe cases in forty-eight hours. I do not mean to say that it can be cured in that time, but the urgent symptoms are relieved. The patients themselves note the relief obtained from commencing the remedy, not a very usual thing. Having got the more urgent symptoms subdued, and the disease in hand as it were, we may reduce the frequency of the drug. In the communication I have already alluded to I stated that the salicylate should be gradually reduced both in quantity and as to the frequency with which it should be given. This is undoubtedly the case, for if we suddenly stop it, immediately on the cessation of the urgent symptoms, say in twenty-four or forty-eight hours, they will certainly return, in diminished force probably, but they will return. The disease has been subdued, but not yet conquered, and it is requisite that the remedy should be continued for a few days, in smaller doses possibly, but at any rate less frequently, alternating it at first with other remedies, such as quinine or iron, and gradually diminishing the frequency of its administration until it is safe to discontinue it entirely. And I believe these to be the reasons why many have been and are disappointed in the use of salicine or its compounds. They do not give sufficiently large doses, and they abruptly discontinue its use. (Dr. David Thomson, p. 157.)

SCARLET FEVER.—*To Limit its Contagiousness.*—The use of an antiseptic ointment during the stage of desquamation is nothing new; but its employment from the very first in conjunction with warm baths, so as to anticipate the development of the infectiousness of the scales, has not, I believe, been previously advocated. That which I have found best suited for the purpose is one composed of 30 grains of carbolic acid, 10 grains of thymol, one drachm of vaseline, and as much simple ointment as will make the whole up to an ounce. The thymol should be dissolved by the aid of heat, as its crystals are apt otherwise to irritate the skin. So prepared, the odour is not unpleasant, while it retains its greasiness for a considerable time after being applied. It should be smeared on in the morning as well as at night, after the bath. When the patient is well enough, one or two thorough washings with carbolic acid soap, in which process the hair and head should be included, will remove any lurking trace of infection. For the throat we now possess a remedy thoroughly efficient and at the same time safe. The whole of the back and sides of the throat

and tonsils should be brushed three or four times a day with a saturated solution of Barff's boroglyceride in glycerine. This is at least three times as strong as a saturated solution of boracic acid in glycerine. When painted on the inflamed throat it causes no pain, and the taste is not complained of even by young children. The inside of the nostrils may be similarly treated if there is any nasal catarrh. All bed and body linen, and everything which can be washed, which the patient has used, should be put into a tub containing one large tablespoonful of carbolic acid dissolved in the water with which it is filled, so soon as they are removed from his person. (Dr. W. Allan Jamieson, p. 149.)

SNAKE POISONING.—The first and most important indication is to prevent the poison entering into the circulation; to this all else is subsidiary. The rapidity with which this takes place depends a good deal on the part of the body bitten, and on its vascularity. When the poison enters a vein, if the bite be inflicted by a vigorous snake, the result is generally rapidly fatal. Experiments on animals show that bites inflicted on parts, even where large veins are not implicated, produce their effects so rapidly that only immediate severance of the part or complete constriction can prevent absorption. It is necessary therefore, as quickly as possible after a bite has been inflicted, to apply a ligature above the wound, and so tighten it as to completely arrest the circulation. As it happens in 94 per cent. that the bite is inflicted on an extremity, this may frequently be accomplished. But in parts where no ligature or elastic bandage or cord can be applied, proceed at once to excise the bitten part; this, indeed, should be done in all cases, ligatured or not. Then make an incision through the bite, reflect the skin, expose the tissue wherever that is altered in colour, dissect it out, and be careful to remove every part of it; next apply cautery or some escharotic, or the permanganate solution, taking care that it reaches as much as possible in every direction where the poison may have infiltrated. After this is done the ligature may be relaxed, for if the virus be destroyed the danger of its entering the circulation is past. Should it have already entered, as is only too probable, all that can be done is to give stimulants, keep the patient warm, at rest, and if the respiration begin to fail use artificial respiration, and endeavour to keep him alive till the poison be eliminated; the temperature should be maintained. In 1869 I gave instructions for the treatment of snake-bite, and, excepting that I would substitute Esmarch's bandage for the ligature recommended by Dr. Wall—that permanganate of 5 per cent. solution should be applied to the

wound when the venom has been carefully dissected out, or injected when it has not been cut out—I have nothing to alter in these suggestions. Suction, being unlikely to be of much avail, is practically useless to the patient and dangerous to the operator, and it should be discouraged, and not relied on. Where the poison has happily been limited to the seat of inoculation, and in cases where no great quantity of virus has been absorbed, we may hope to do good, but where the poison has entered the circulation in larger quantities and the physiological symptoms are developed, the prognosis is exceedingly unsatisfactory.

Instructions.—As soon as possible after a person is bitten by a snake, apply a ligature made of a piece of cord, or an elastic bandage, round the limb or part at about two or three inches above the bite. Introduce a piece of stick or other lever between the cord and the part, and by twisting, tighten the ligature to the utmost. After the ligature has been applied cut the punctures to the depth of a quarter of an inch with a penknife or other similar cutting instrument; let the wounds bleed freely; or, better still, excise the punctured part and all the infiltrated areolar tissue subjacent to it. Apply either a hot iron or a live coal to the bottom of these wounds as quickly as possible, or inject into the subcutaneous cellular tissue a solution of permanganate of potash—5 per cent., or some carbolic or nitric acid. If the bite be where a ligature cannot be applied, with a sharp penknife cut out the bitten part and all the infiltrated cellular tissue to a depth of a quarter or half an inch. Then apply the hot coal or hot iron to the very bottom of the wounds, or better, the permanganate of potash. Give fifteen drops of solution of ammonia diluted with an ounce of water, immediately, and repeat it every quarter of an hour, for three or four doses, or longer, if symptoms of poisoning appear. Or give hot brandy, or rum, or whisky, or spirits, with equal parts of water, about an ounce of each (for an adult) at the same intervals. Suction of the wounds is not very likely to be beneficial, and as it may be dangerous to the operator, it cannot be recommended. If symptoms of poisoning set in and increase, if the patient becomes faint or depressed, unconscious, nauseated, or sick, and respiration begins to fail, with symptoms of paralysis of tongue and fauces, apply mustard poultices, or solution of ammonia on a cloth, over the stomach and heart; continue the stimulants and keep the patient warm, but do not shut him up in a hot, stifling room, or a small native hut—rather leave him in the fresh air than do this. Chronic —*i.e.*, milder—cases must be treated on the same and general principles. (Sir Joseph Fayrer, p. 167.)

AFFECTIONS OF THE NERVOUS SYSTEM.

ANTIDOTE FOR ARSENIC.—*Hydrated Oxide of Iron.*—The following is a simple method of preparing hydrated oxide of iron, the antidote for arsenic, one of its chief advantages being that its ingredients are always easily obtained: ℞. Tr. ferri chlor. ʒiv., aquæ ʒiv.; mix in a vessel of twelve-ounce capacity, and add aquæ ammon. ʒij. Shake well, pour on a large wet muslin drainer, wring out the water and alcohol, and wash with fresh water. The stomach having been evacuated by emetics while the antidote was preparing, give four fluid ounces at once, to be followed by an emetic. Then give two ounces every ten minutes. (Dr. Squibb, Medical Times, Nov. 17, p. 582.)

BROMIDE AND IODIDE OF SODIUM SUPERIOR TO POTASSIUM IN VARIOUS NERVOUS DISEASES.—Experiment shows that potassium and its salts are much more poisonous than those of sodium on the entire organism, and much greater depressants, both general and local. Bromide of sodium is now very largely used in America in preference to the potash salt, and I was induced to try it fully after observing the bad effects of the latter when given in large doses for insomnia (amongst which were general depression, mental and bodily, malaise, and irritability of temper the next day), or in smaller and long-continued ones for epilepsy, &c., an almost toxic effect being often induced, showing itself in mental weakness, clouded intellect, failure of memory, with an expression of hebetude passing on to temporary imbecility, and also so-called "bromism," whether owing in part or whole to the potash remains to be seen, but doubtless due to a great extent to induced diminished elimination of carbonic acid. Its acrid taste (like salt water) is often objected to, and may cause diarrhœa and vomiting in the feeble, anorexia and sour eructations. The bromide of sodium lacks many of these disadvantages. After large doses for insomnia, &c., there is much less depression, and in smaller ones for long periods the toxic effects are slight; so far I have observed no symptoms of bromism nor any skin eruptions. Neither dyspepsia nor acidity of the primæ viæ is caused by it, but these conditions are much diminished if beforehand existing, the taste is less objectionable, it constipates rather than the reverse, and has greater tonic action than the potash combination, but is contraindicated with much phosphates in the urine. There being rather less bromide in the soda than the potash salt, the former should be given in somewhat larger doses. Roughly, fourteen grains of the soda salt compound to twelve of the potash.—The following were some of the diseases I treated

exclusively by it when at the Leeds Public Dispensary. Of pertussis (uncomplicated) eighty-seven cases were treated, ranging in age from two months to twelve years, the dose varying from three grains to half a drachm, not oftener than every three or four hours night and day, the average length of treatment being four to seven weeks. Twenty-seven were entirely cured by the drug. Forty not showing any great improvement after two or three weeks' treatment had other drugs combined with it, and the remainder showed no improvement or failed to attend. The cases somewhat relieved were cured by bromide of potassium and belladonna liniment to the throat externally. The potash salt therefore has greater effect on pertussis than the soda one, owing to its greater depressant action on the cerebrum, &c., and I should give it the preference unless great weakness already exists, as in rickety infants and others. In women approaching the menopause and suffering from the usual train of nervous symptoms, with abdominal and cranial pains, tinnitus aurium and flatulent dyspepsia, the soda salt in half drachm doses causes less depression and sinking than the potash one, and the dyspepsia also is relieved and soon cured. In menorrhagia and metrorrhagia from whatever cause, there is no difference between the action of the two drugs. In the weary muscular pains following severe straining, as after diarrhœa, &c., the soda salt is of great comfort, and brings on no return of the looseness, as the potash one often has done in my experience. In various forms of headache, neuralgia, and nerve excitement where an hypnotic is needed, the soda salt in large doses is followed by little or no sign of lassitude or sense of weakness, as is often seen after the potash one. This applies to insomnia from whatever cause arising, also to puerperal mania with great depression. Moreover, the hypnotic action not being so great as that of bromide of potash, a larger dose (one-fifth) was always given in these cases. It is also useful in incipient and pronounced delirium tremens, also in hysteria and chorea, and is longer than the other salt in making a decided impression when pushed in these cases.—In several severe cardiac cases, where pain and insomnia threatened to bring on dementia (and also in cardiac cases complicated with epilepsy), and where I feared the depressant and toxic action of the potash salt (hypodermic morphia being contraindicated owing to renal disease), fifty to eighty grains of sodium bromide caused several hours' sleep without affecting the heart-muscle to any extent, this being given for many nights. It is also of great use in irritable and palpitating heart, without organic lesion, as in excessive tea and coffee drinking, and when of dyspeptic origin. In petit mal no difference was

noted between the drugs, but in the graver form the soda salt could be administered for periods of eight or ten months (the longest time under observation) with far less toxic signs or those of depression. In seventeen cases where the drug was given for this period with great benefit up to ninety grains thrice daily, no signs of "bromism," &c. appeared. One interesting case in point presented itself, that of a boy aged twelve, who had taken for epilepsy three or more drachms of the potash salt usually thrice daily during four years. He had now a fit every two or three weeks, and but mildly. He frequently fainted, the pulse being slowed and intermittent, and the bowels very confined. He had quite lost memory, was silly, and had always a curious expression of hebetude and languor. Several times he tried to drown himself, and would run about the streets naked unless closely watched. Up to the age of eight he was "like other boys," and had never experienced an accident or any head injury. The drug was omitted for six weeks, during which he had two fits (sixth week), and became more rational and intelligent. He was now put upon ten grains of sodium bromide thrice daily, and had no attacks for ten weeks but then failed to attend. (Mr. T. J. Hudson, M.B., Lancet, Dec. 22, p. 1081.)

CHLORAL POISONING.—*Belladonna.*—In a case of chloral poisoning, the profound depression of the respiratory and circulatory centres showed the patient to be in a dangerous condition. Strychnia first suggested itself as the most effective means of restoring the activity of these centres; but tincture of belladonna being at hand, and remembering the effect of belladonna in keeping up the respiration under large doses of morphia, I determined to try it. The patient was accordingly made to swallow nearly a teaspoonful of the tincture in a little water. In a few minutes the respiration became more perceptible, the heart's action more distinct, and the pulse-rate slower and stronger; and in a short time he could be roused by even slight excitation. I then left him, after putting the belladonna out of his reach, and telling his friends to give him twenty drops of it if he showed any sign of relapsing into his former condition. One such dose was given three hours later, when he seemed to be breathing less perceptibly than usual. and the friends said that he flushed up and muttered a good deal after it. Two days' rest in bed and a stomachic tonic set the patient on his legs again. Belladonna, from its powerful action on the centres of circulation and respiration, has been successfully used in cases of poisoning by aconite and Calabar bean, and by its means the circulation and respiration can be kept up during the exhibition of large doses of morphia or opium

without interfering with their anodyne and hypnotic effects. Whether it has been employed in the treatment of chloral poisoning, or whether it has been given along with chloral, as it has with opium where cardiac or pulmonary complications are present, I am not aware, but, to judge from the success which attended its employment in the above instance, I think its administration in such cases worthy of a trial.—(Dr. J. Mackenzie Booth, p. 185.)

CHOREA.—*Ergot.*—Assuming the correctness of Dr. Dickinson's observations on the state of dilatation of the smaller vessels of the brain and spinal cord in many cases of chorea, it occurred to me that the administration of ergot might prove useful. Accordingly, in a case which has recently come under my treatment I began with five minims of liquid extract of ergot thrice daily. At the same time, with the view of allaying the irritability and imparting tone to the motor and sensory nerves, I added to the mixture one minim of arsenical solution. The patient was a boy seven years of age, who twelve months ago had an attack of acute rheumatism. The heart was unaffected. General choreic movements were present; the tongue could not be protruded; swallowing was accomplished with great difficulty, the child only being able to take fluid nutriment. The mother told me that his sleep was much disturbed. Continuing the treatment for a week, the state of my patient was not markedly changed; but during the second week the movements were very distinctly lessened, sleep was much improved, and he could walk with greater ease. In the course of the next week the tongue could be quietly protruded, and the movements of the arms were much less marked. I can truly say that I never saw a worse case of chorea than this boy presented, and his improvement was strikingly rapid. Of course I do not presume to dogmatise where the treatment has been followed out in the case of a single patient, but it appears to me that the administration of ergot is physiologically appropriate, checking the hyperæmia of the nervous centres. Arsenic alone does not act so rapidly as its combination with ergot did in this case. I may add that cod-liver oil was given internally, and cold sponging to the back every morning. I should be very interested to know the results of the administration of ergot in a number of cases by those who have more opportunities than I have.—(Mr. J. Rocheid Forrest, Lancet, Jan. 26, p. 191.)

CONVULSIONS IN ALBUMINURIA OF SCARLET FEVER.—*Pilocarpine.*—In the case recorded the convulsions were kept under by means of chloroform, which was not, however, pushed far

enough to stop them. After a further lapse of 45 minutes, the fits continuing as before, 1-13th gr. of pilocarpine was injected into the arm. Soon the skin became moist, and in from 10 to 15 minutes patient was salivating, and was bathed in a profuse perspiration, great beads of sweat standing on the face, and, in the course of fifteen minutes after the injection, and an hour and 25 minutes from their first appearance, the fits ceased and never recurred. (Frank Shearer, M.B., Glasgow Med. Journal, Jan., p. 10.)

HEADACHE.—*Menthol.*—This drug has never failed to relieve my own headache, or any nervous headache in my care. I simply wet the finger with the following mixture, and pass it several times over the forehead. ℞. Menthol, ʒj; alcohol, ʒj; olei caryophylli, olei cinnam., āā ♏xx. M. (Dr. F. O. Lockwood, Therapeutic Gazette, Oct. 1883.)

HYPODERMIC INJECTION OF PHOSPHATE OF CODEIA.—Dr. Fronmüller employs the phosphate of codeia for hypodermic injection. He says that it possesses the advantage over the muriate and sulphate of being much more soluble. The substance crystallises in slender, four-sided columns, is white in colour and of a bitterish taste, and is soluble in four parts of water. Its action is very like that of morphia, but it is milder, and the symptoms of poisoning (such as great weakness, intense headache, bilious vomiting, &c.) are much less often encountered. It seldom causes local irritation when subcutaneously injected. The dose should be at least double that of morphia. The phosphate of codeia is especially recommended in the case of women and children. (Practitioner, Jan., p. 54.)

INSOMNIA.—*Hydrobromic Acid.*—Dr. Dana, in a communication to the American Neurological Association (Phil. Med. Times), on the substitution of this acid for the alkaline bromides in insomnia, said that it should be given in larger doses than those usually employed. He had recorded very satisfactory results from drachm doses of the officinal 10 per cent. solution. It may be substituted in all the milder disorders in which the bromides are used, especially in those requiring vascular and nervous sedation. In epilepsy some patients had markedly improved under drachm doses four or five times daily, while others had derived no benefit. In chorea and alcoholism it has been used as an adjunct to other treatment. It is a good solvent of quinine, but does not, contrary to the usual belief, prevent cinchonism.—Dr. Hammond observed that, after several years' trial, he had abandoned this agent in consequence of its inferiority to the bromides; but he was satisfied that it really does possess the power of preventing

the unpleasant nervous effects of quinine.—In this last opinion Dr. Eskridge agreed, and he also recommended the use of the acid to relieve insomnia occurring in typhoid conditions. (Medical Times, Nov. 24, p. 609.)

MANIACAL DELIRIUM.—*The Cold Douche.*—In a case of maniacal delirium I followed on the lines indicated by Dr. Broadbent. The bed and bedclothes were removed, and a large mackintosh coat was spread over the mattress, and over this a piece of sacking was placed. The patient was then stripped, and a spongeful of cold water squeezed down his neck and back, and then freely splashed over his face and chest. It quieted him immediately. He said it was nice, and he was well pleased to have it repeated. He was then vigorously rubbed and dried, and some strong broth was given to him, which he thoroughly enjoyed. During the rubbing process I noticed that he gave one short, loose cough. The bed was soon made; there was not the slightest difficulty in getting the patient to lie down and close his eyes, and presently he dropped into a quiet sleep. We left his friends with the instruction that if he became violent again the same treatment was to be repeated, and that he was to have no physic, but only some egg and milk or broth whenever he should awake. His wife was also told by way of precaution that it was by no means infrequent in such cases (even when not treated by cold douche) to get pneumonia, and that therefore this was one of the things for which to be prepared. The patient slept quietly for four hours, then woke and was violent again. He was douched by the friends in the same way as before, and once more lay down and slept quietly. Everybody who has employed cold baths extensively must have been struck with the marked improvement in intelligence which often takes place when a delirious patient is placed in the bath. In this case a cold bath was not to be got, and the douche answered quite as well and gave much less trouble. (Dr. T. Barlow, p. 179.)

NEURALGIA.—*Subcutaneous Injection of Hyperosmic Acid.*—The latest agent introduced for the relief of neuralgia is a 1 per cent. solution of hyperosmic acid, administered by subcutaneous injection. It has been employed in Billroth's clinic in a few cases. One of the patients had been a martyr to sciatica for years, and had tried innumerable remedies, including the application of electricity no fewer than 200 times, whilst for a whole year he had adopted vegetarianism. Billroth injected the above remedy between the tuber ischii and trochanter, and within a day or two the pain was greatly relieved, and eventually quite disappeared. It would be rash

to conclude too much from these results, in the face of the intractability of neuralgiæ to medication, but if it really prove to be as efficacious as considered, hyperosmic acid will be a therapeutic agent of no mean value. (Lancet, Nov. 24, p. 919.)

NEURALGIAS AND LOCAL SURFACE PAINS.—*The Ether Douche or Lavement.*—Ether lavements have been employed by me in all painful surface-affections for many years, whether with or without inflammation, but mainly in neuralgic affection. In facial, sciatic, and cervical neuralgias, no remedy except galvanism has given me such signal satisfaction during the past ten years of my practice in neurology. These lavements will cure some cases of recent origin; they will relieve all. I use the ether douche, not the spray. In one case of intense pain of cerebellar abscess, I simply poured the ether on the head so copiously as to benumb all sensibility and restore a state of ease and mental tranquillity to a patient absolutely maddened with pain.—The ether douche or lavement in *trigeminal neuralgia* is quite uncomfortable to many persons, on account of the unpleasant impression of the ether on the nose and eyes; and when applied to the supra-orbital region great care should be taken to keep the ether out of the eyes by laying the head back and covering the eyes with a handkerchief. If the ether should get in the eyes, the patient should be cautioned not to rub them, but simply to sponge the eyes with cold water and wait patiently till the ether evaporates. The same is true in regard to ether getting in the ears.—There is no need of a spray apparatus for ether. It should be used freely in quantities adequate to the effect desired. It should be poured on the part till relief is obtained. I apply it in this way to the motor regions of the head and down the spine in general or unilateral chorea likewise.—No better agent can be employed for *cephalalgia* and for *acute muscular tremor* than the ether douche or lavement. Of late years I have heard of the ether spray, but the ether *douche* or lavement has been with me a most common and efficient agent in the local therapy of pain, especially superficial pain, for more than a decade, ranking with electricity, and better than mechanical vibration. (Dr. C. H. Hughes, Philadelphia Med. Times, Sep. 8, 1883.)

NITRITE OF SODIUM AS A TOXIC AGENT.—As a recent article on this subject (see p. 173 of this volume) has excited adverse criticism in the daily newspapers, I venture to ask permission to make an explanation, especially as the purport of the article seems to have been misunderstood. In the early part of last year a paper was published, recommending nitrite of

sodium as a remedy for epilepsy, and the case was recorded of an epileptic who took twenty grains three times a day for fourteen days, not only without ill effect, but with marked benefit. I was interested in the subject, because it was stated that nitrite of sodium was allied to nitrite of amyl and nitroglycerine, but more persistent in its action. Having had considerable experience of this last-named remedy, and having for some years past used it with marked success in the treatment of many diseases, including angina pectoris, pseudo-angina, asthma, neuralgia, megrim, rheumatism, and the various forms of Bright's disease, I obtained some nitrite of sodium, and happening at that time to have under my care several patients suffering from angina pectoris and allied diseases, I hastened to give them the benefit of the discovery, and in the course of the week prescribed it in those various diseases and conditions in which I had found nitroglycerine useful. I gave it, not in the dose recommended, but in half that quantity. There was therefore no want of caution on my part. In ordinary out-patient practice patients are seen only once a week, and thus it was I prescribed the drug in several cases before I had seen any of the patients a second time. The first man who returned stated, in answer to my inquiries, that the medicine had not affected him in any way. I was not surprised, for I thought the dose too small, and I accordingly increased it to fifteen grains. This, I may say once for all, is the only case in which the dose was increased. The second patient was a man who, as it subsequently appeared, suffered only from a little rheumatism, although at the time the symptoms resembled closely those of angina pectoris. He complained of the effects produced by the medicine, and said it made him "feel giddy." He described other symptoms, but it seemed unlikely that they could have been produced by the drug, for it had been recommended in so much larger doses, and I had myself just seen a man who had taken the very same dose three times a day for a week without making any complaint. I asked the patient how many doses he had taken, and he said only one. I advised him to try it again, but he declined, adding jokingly that he had "a wife and family." I said no more, and he subsequently improved on other treatment, although his case was an obstinate one. The other patients came back one by one, and as they all complained, I soon saw that it was really the medicine that was at fault. This was the first intimation I had had from any source that nitrite of sodium was a toxic agent. I at once and in every case reduced the dose to five grains, half the dose that I had before given, and one-fourth the dose originally recommended. Finding

that this still produced unpleasant symptoms, I reduced it still further, giving only three grains, and in this dose I have used it largely during the last twelve months with marked success in many diseases. I was so astonished by the unexpected effects produced by the drug that I consulted Dr. Ringer on the subject. At that time he had no idea that nitrite of sodium was a toxic agent, and shared my previous belief that it might be given with safety in twenty-grain doses. To clear up the matter, he made some observations on cats, forwarding me the results, and at the same time urging me to publish my cases. I felt that I had no option in the matter, and that to suppress them would be little less than criminal. I wrote the paper under a strong sense of duty, and Dr. Ringer being my senior, I naturally placed his experiments first in order. I wish it to be distinctly understood, however, that the experiments on cats were not made until long after I had observed those symptoms in my patients, and that they were undertaken with the view of throwing light on the disagreeable effects. In every case I had used the pure nitrite of sodium, and did not prescribe it until I had a guarantee that it was free from adulteration of any kind. The nitrite of sodium in common use contains a large proportion of the comparatively inert nitrate of sodium. There is only one other point which I wish to notice. It has been said that the paper was written in a flippant style. This I do not admit. The paper was written with an earnest purpose, and from a strict sense of duty. If the style do appear flippant it is unwittingly so. The terms I used were the patients' own expressions, and had they been given with the usual quotation marks, I cannot believe the charge of flippancy could ever have suggested itself to anyone. By the light of subsequent comments, the account I gave does seem unnecessarily alarming. As a matter of fact, however, the remarks of the patients were for the most part made jokingly, and certainly without any permanent sense of fear. (William Murrell, M.D.)

I have read Dr. Murrell's letter of explanation, and cordially subscribe to its terms, and would be glad to be allowed this opportunity of correcting an erroneous statement in the new edition of my "Handbook on Therapeutics." The dose of nitrite of sodium should be small, two or three grains and not *twenty*, as there stated. (Sidney Ringer, M.D.)

Dr. W. T. Law states that in the case he described in the Practitioner in June, 1882, in which nitrite of sodium was given in twenty-grain doses without injurious effects, it was subsequently ascertained that the drug was largely adulterated with nitrate. Dr. Law desires it to be understood

that his conclusion as to the value of the nitrite was based upon the employment of what was eventually ascertained to be a very impure specimen of the salt. (Lancet, Nov. 17, p. 880.)

PARALDEHYDE AS A HYPNOTIC. — (1) Paraldehyde has a hypnotic action, but less marked than that of chloral. (2) Given in small doses (such as 3 grammes in 100 grammes of honey and water), it produces tranquil sleep, without leaving in the morning a sense of weight in the head, dulness, or any of the inconveniences generally caused by narcotics. (3) It augments to a certain degree the urinary secretion. (4) It does not produce any disorder of the circulation, nor any symptoms of intolerance, and it is, in fact, a valuable acquisition to therapeutics. (Prof. Silvestrini, Glasgow Med. Journal, Jan., p. 66.)

PTOMAINES, OR CADAVERIC ALKALOIDS.—(1) There are developed in the body, post mortem, poisons of an alkaloidal character, and which can be obtained also by decomposition of albumen, peptone, casein, muscle, brain, &c. Moreover, they seem to be present in some normal secretions (saliva and urine). (2) These cadaveric alkaloids may be mistaken, post mortem, for vegetal poisons administered with evil intent, but if the body be examined within from twenty-four to forty-eight hours after death, any alkaloid there found would be strong presumptive evidence of poison, and not ptomaine. After a couple of days it may be a matter of doubt. (3) There is no satisfactory test surely indicating the presence of a ptomaine. Physiological characters must be taken in conjunction with chemical tests. (4) Probably the production of ptomaines within the living body may be the pathological cause of many obscure conditions, especially those following on poisoning by bad food, such as stale fish, &c. (R. N. Wolfenden, M.B.Cantab., Lancet, Nov. 17, p. 853.)

TETANUS.—*Crotaline.*—The marked antagonism displayed by the symptoms in cases of traumatic tetanus and snake-poisoning has led Dr. Annam, of New York State, to experiment with crotaline, which is the venom of the poisonous snake. In the one case we have some subtle influence at work in the nervous centres that causes extreme rigidity and spasm of nearly the entire voluntary muscular system—in the other an equally poisonous principle attacks the medulla oblongata and spinal cord, producing paralysis of both the voluntary and involuntary muscles. Dr. Annam narrates a case of which the following is a precis:—Patient, male, 25 years of age; traumatic tetanus followed punctured wound of foot; first tetanic symptoms three days after receiving

wound; twenty-four hours later, complete opisthotonos and other symptoms of the most aggravated form of tetanus. A few hours later patient was perceptibly worse, and the case presented no indications of a favourable termination. Chloral, bromide of potassium, and chloroform were freely used without any apparent beneficial effect. Woorara could not be obtained. Being in a locality where rattlesnakes are plenty, a snake-catcher was employed, and venom fresh from the fangs obtained. With this the point of a hypodermic syringe was moistened, and inserted beneath the cuticle in the dorsal region near the spine. Symptoms of snake-poisoning rapidly followed, with amelioration of tetanic spasms and rigidity, which entirely ceased at the end of ten hours, and patient slept for six hours. Thirty hours after insertion of poison rigidity, with slight spasms, came on again. Snake-poison was again inserted, and the patient made a fairly rapid recovery; but extreme prostration followed the last introduction of venom, which necessitated active alcoholic stimulation, as in all cases of accidental snake-poisoning. There was no diffuse inflammation from the wounds, and Dr. Annam is of opinion that the second insertion of venom was too much, and might have been withheld. There were no results in the case which would deter him from adopting the same course again, and he is of opinion that crotaline may yet prove to be a valuable remedial agent in tetanus, and possibly in some other spasmodic diseases. (Dr. Annam, Dublin Journal of Med. Science, Jan., p. 59.)

AFFECTIONS OF THE CIRCULATORY SYSTEM.

ANÆMIA, IDIOPATHIC.—*Arsenic.*—In arsenic we have a medicine exercising what may almost be termed a specific action in "idiopathic anæmia;" that in a clearly recognised case it is useless, and worse than useless, pouring in iron, and, unless as auxiliaries, other tonics; that arsenic appears to act best in its simple and uncombined form, and that its action is rather interfered with than otherwise by combination with iron; that the failure of iron—so potent in other forms of anæmia—serves as a kind of therapeutic diagnostic between these and idiopathic anæmia; and that the prognosis and directions for treatment of our chief authorities on medicine and therapeutics are, I say it with all deference, misleading and unduly discouraging, inasmuch as they are either altogether silent upon, or enumerate cursorily with other medicines, the only agent which appears to have exercised a real and essential influence upon the disease, and which has undoubtedly been the means of rescuing a large proportion of

sufferers from its otherwise deadly power. In a severe and typical case of this malady I prescribed my patient two minims of arsenical solution thrice daily, increased at short intervals to four minims. This he took punctually, and in less than a fortnight showed signs of amendment. Three weeks after first taking the medicine, I report: "Still improving; pulse stronger, less compressible; tinge of red returning in the lips; waxy pallor less marked; 'thumping of the heart' much less; continues to take food better; enjoys his mutton chop; less breathlessness, able to walk upstairs quietly without discomfort; sleeps well; goes out daily for a drive or short walk in the garden, weather permitting; urine, sp. gr. 1021, rather high-coloured, no bile or albumen; microscopic characters of blood decidedly improved." The rest is but a record of progressive advance towards recovery, interrupted occasionally in minor particulars. In a fortnight after the commencement of the treatment by arsenic, even in the small doses at first given, the patient showed symptoms of amendment, and in less than a month the icteroid pallor had given place to a tinge of red in the cheeks, and a more decided restoration of colour to the lips, &c., greater capability of exertion, less breathlessness—in short, a marked subsidence of all the symptoms. (Mr. George Padley, p. 191.)

ANGINA PECTORIS.—*Nitrite of Sodium and Nitrite of Amyl.*—In a case of angina related by Dr. Hay, nitrite of amyl and nitrite of sodium were in turn tried, the opinion formed being that the influence of nitrite of sodium and its power of mitigating an attack extended over a much longer period than was the case when nitrite of amyl was used, though it was observed that the effects of the nitrite of sodium were much longer in developing; hence the necessity of taking it some time from ten minutes to half an hour before an expected attack. Dr. Hay claims that in therapeutic doses nitrite of sodium, while producing all the beneficial effects of nitrite of amyl, does not produce the disagreeable general effects of nitrite of amyl—headache, giddiness, &c. There is one other great advantage, its cheapness, as Prof. Balfour has shown that only a freshly prepared specimen of nitrite of amyl, or one that has been kept in an hermetically sealed capsule, is trustworthy, as an old specimen, though it may produce all the usual symptoms of the drug—flushing of the face—will often not relieve the angina, which will at once give way to a newly prepared specimen. Now an ordinary dose of nitrite of sodium would cost considerably less than one halfpenny, while the nitrite of amyl capsules cost between 3d. and 4d., the latter being quite beyond the reach of out-

patients, who in many cases would require from six to ten per diem. (Dr. W. Collier, p. 196.)

CARDIAC DROPSY.—*Digitalis.*—Although the diuretic action of digitalis in cardiac disease with dropsy is perfectly well known, it is very rarely indeed prescribed in this part of the country in that form in which its diuretic action is most marked. My attention was drawn to this as long ago as fifteen years since by the following case. A man with extreme anasarca from cardiac disease, but without as yet the appearance of the skin or the legs indicative of threatened dermatitis with sloughing passed several days and nights sitting on the edge of the bed suffering from extreme dyspnœa. Southey's capillary tubes were not then invented, and I always punctured the legs with a needle in cardiac dropsy with great reluctance. I ordered the patient to drink freely of freshly prepared but weak infusion of digitalis. This caused a very copious secretion of urine, which continued until the dropsy had entirely disappeared, and the man actually resumed his occupation of travelling for orders in some business, and I saw him about in the streets occasionally for several years. From that time I have invariably used this treatment, and some of the cases have been very remarkable. I generally order half a small or medium-sized leaf to be infused, with the addition of a little black tea, in about twelve ounces of boiling water, and taken daily. By this means we get the full diuretic effect of the drug, in addition to its action on the muscle of the heart. The action of the ordinary tincture and of the powder given in pill is, as a diuretic, hardly noticeable, and the usual combination with squills, solution of acetate of ammonia, and spirit of nitric ether is much inferior to the infusion. A few months ago I saw, with a gentleman in Leeds, a case of cardiac dropsy very similar to the one related, and his first words when we were alone were, "Well, I suppose you will say that it is a case in which no good can be done?" and he was apparently surprised at my reply, "On the contrary, I think it a very promising case." I heard some weeks afterwards that that patient was getting better, or was very much relieved. The fact is, there are many cases of cardiac disease in which a complete break-down would not have occurred but for some external circumstances—I mean external to the heart,—as an attack of bronchitis or impairment of the health by want of rest, especially if combined with food that is poor in quality; and when dropsy has once occurred, the circulation becomes more and more embarrassed. Let, however, the dropsy be removed, and another chance is given to the heart to recover itself. In this it is aided by the action of the drug on its muscular fibre and by the absolute rest of the patient. Once

a year, during some country journey in autumn, I collect a quantity of leaves and dry them for use. The matter is by no means new; but I have taken the opportunity of asking various medical men about their use of digitalis, and have only met with one who uses it in infusion. (Dr. James Braithwaite, Lancet, Dec. 17, p. 355.)

The great advantage of the fresh infusion of digitalis came under my notice more than thirty years ago. I was at that time assistant with Mr. Butler, of Brentwood, and he prescribed it in cardiac dropsy in combination with acetat. potass, &c. The leaves were gathered before the flower-buds began to burst, were laid on a creel to dry, and when thoroughly dry were dropt lightly and singly, not pressed at all, into paper-bags and tied up ready for use. Mr. B. preferred the lower leaves of the plant, fancying they had more digitalin in them than the others. The infusion was the ordinary strength ʒ j. to one pint of boiling water—dose ʒ ij. to ʒ iij. I send you the formulæ used and also the way he exhibited the remedy. At bedtime the patient took two pills (℞. Ext. coloc. gr. iv; pil. hydr. gr. iv; divid. pil. ij.) Early the following morning, fasting, ℞. Pulv. jalapæ co. ʒ ss. (to ℈ ij.); spt. lavand. co. ʒ i; aqua menthæ ad ℥ iss. ft. haust. Then followed the mixture. ℞. Infus. digital. ℥ ij. (to ℥ iij.); potass. acetat. ʒ ij.; potass. nitrat. ℈ ij.; spt. ammon. co. ʒ ij. (to ʒ iij.); spt. ether. nit. ʒ iv. (to ʒ j.); aqua ad ℥ viij. Two table spoonfuls every four hours. I have since always adopted this treatment in suitable cases (varied somewhat according to the strength and condition of the patient) with *very* good results. The remedies may to some appear rather heroic, but it is really astonishing the extent of active treatment a patient with this complaint will bear without suffering extreme depressing results. Should there be any faintness with the action of the pills and draught, I always order a little stimulant to be given. (Note by Dr. H. E. Brameld, of Saltburn-by-the-Sea.)

CARDIAC PALPITATIONS.—M. Peter explains the occurrence of palpitation of the heart as being due to different circumstances affecting its innervation. Palpitation may be due either to excess or defect of innervation. Under the first head come those forms of palpitation that result from stimulation of the ganglionic cells of the myocardium, from stimulation of the great sympathetic, or from increased activity of the heart in endeavouring to overcome an obstacle (spasmodic palpitation). The second form of palpitations result from a diminution in the activity of the pneumogastrics, from fatigue, or from an alteration in the myocardium (paralytic palpitations). Side

by side with this kind of physiological antithesis, in palpitations being due either to excess or to defect in innervation, a form of pathological antithesis is also observed in the occurrence of palpitations resulting from plethora as well as from anæmia. (Dublin Jour. of Med. Science, Jan., p. 79.)

DISEASES OF THE HEART.—*Caffein.*—Citrate of caffein can be favourably compared with digitalis in diseases of the heart, when an ordinary dose, 1·0 per diem—in exceptional cases 2·0 to 2·5—is given. The good effects of caffein have not been brought out because the dose was not large enough. It has a tendency to act more rapidly than digitalis. Not infrequently the pulse has been known to fall from 160 to 100 in the course of twenty-four hours. Dilatation of the heart and also venous stenosis are very much relieved in the course of two or three days. Caffein has no cumulative action like digitalis, and symptoms of intoxication have not been known to follow its administration. The patients themselves prefer it to the foxglove. The only objection to the remedy is a certain amount of irritation which causes nervousness and restlessness, thereby preventing the patient from sleeping, and then it is very high priced. (Therapeutic Gazette, Nov., 1883.)

LIGATURE OF ARTERIES.—To the dissector nothing seems easier than to tie the *brachial artery*, but the actual operation is by no means so simple, on account of the surroundings of the vessel. In bleeding palmar arteries, where a compress does not command the hemorrhage, it is usually preferable to tie the brachial at once: ligature of both radial and ulnar vessels is inefficient where the hemorrhage is persistent, for the interosseal supplies blood in their stead. In ligature of the *femoral artery* I prefer cutting over the sartorius rather than on its inner side; there is thus less risk of injuring the saphena vein, and the artery is more directly under the incision when the muscle is drawn aside. Moreover, by cutting too much to the inner side the edge of the sartorius might be missed, and the adductor longus be mistaken for it: but this could not happen to a competent anatomist, though I have repeatedly seen it happen, in the dead body, to those who ought to know better. Ligature of the *posterior tibial artery* is not so difficult an operation as is often represented; it is only rendered so by ignorance of the relative anatomy of the parts concerned. The same may be said, in a minor degree, of the anterior tibial high up: the adhesion of the muscles to the fascia is apt to confuse their relation to each other in the operation, and may thus mislead the surgeon. My experience of *secondary hemorrhage* after ligature of an artery in its

continuity is that it occurs rarely in a healthy vessel, but is much to be dreaded in one of degenerate tissue. I cannot recall a single instance in which I have had occasion to tie a vessel of any size a second time from this cause. (Mr. F. Le Gros Clark, St. Thomas's Hosp. Reports, 1883, p. 30.)

MITRAL CONSTRICTION.—*Diagnosis of.*—Simple mitral constriction is of far more frequent occurrence than is generally allowed, and its diagnosis probably presents greater difficulties than any other serious lesion of the valves on the left side of the heart. We exclude from consideration cases which are complicated by regurgitation, because the latter, when advanced enough to produce grave symptoms, is easily detected; and the presence of constriction as well in such cases is not of great practical importance. But when, as not rarely occurs, the question is whether stenosis of the mitral orifice be present, and the cause of serious symptoms, or whether the heart be healthy, and the distress and danger due to other conditions, accurate diagnosis becomes a matter of the utmost moment. In a typical case the observer feels a thrill at the apex preceding the impulse of the heart; he hears at the base a clear second sound over the aortic valves, an exaggerated one to the left of the sternum, and at the apex a rolling præsystolic murmur, gradually increasing in intensity and leading up to a short and sharp first sound, which is not succeeded by any appreciable second sound. The diagnosis of mitral stenosis under such circumstances admits of little doubt.—But in a second series of cases both murmur and thrill may be absent, and the heart's action regular, and the difficulty of detecting the disease then becomes great. The most striking auscultatory phenomena are accentuation of the second sound at the base to the left of the sternum, and, what is of much greater importance, a peculiar hesitation in the production of the first sound, a kind of hanging-fire, which is easier for the experienced auscultator to appreciate than to describe. Whatever be its origin, whether it be a faint sound caused by the blood passing through the constricted orifice into the ventricle, and so practically a murmur, or be due to a slowly beginning, though suddenly ending, ventricular contraction, it is a phenomenon which at once strikes the ear and suggests the nature of the disease. In these and all other cases of suspected constriction of the mitral orifice, the detection, if possible, of increase in size of the left auricle and right side of the heart, yields valuable corroborative evidence.—There is a third class of cases, in which there may be no murmur, no thrill, no hesitating first sound, but extreme irregularity of cardiac action, the beats being very frequent and very irregular both in rhythm and in force; so much so that a great

many of them produce no pulsation at the wrist. In some cases as many as half the beats of the heart are not felt in the radial artery, so that the pulse there may be moderate in frequency, although the cardiac contractions succeed each other with extreme rapidity. Similar phenomena may likewise be observed in cases of simple dilatation of the heart with degeneration of its walls, such as occurs, for example, in chronic bronchitis and emphysema; but then the patient is usually past middle life. If grave cardiac symptoms be found in a comparatively young person, and if auscultation only reveal extreme irregularity in the heart's action, the presence of mitral stenosis ought to be at once suspected. The administration of digitalis in such cases not only often removes the patient's distress, and produces regularity and normal frequency of the heart's beats, but also facilitates diagnosis. For when the heart's action gets slow and regular a præsystolic murmur frequently makes its appearance.—Finally, there are cases of considerable mitral constriction which produce no sufficiently well-marked morbid phenomena to enable the observer to detect the presence of heart disease. But the pathologist not infrequently meets with these narrowed orifices in the post-mortem room in patients who have died from other diseases. The reflection is then forced upon him, how extreme some pathological conditions require to be before they come within range of our present powers of diagnosis. (Ω, Medical Times, Jan. 5, p. 25.)

NÆVUS.—*Local Application of Liquor Arsenicalis.*—The ordinary treatment of nævus appears so severe, that mothers naturally object to it (the knife, for example, or even puncture or vaccination). I was, therefore, led to try what arsenic would do as a local remedy, and in my hands it has succeeded admirably, my last eight cases having been cured perfectly and painlessly by the local application of this remedy. The preparation I use is the ordinary liquor arsenicalis of the Pharmacopœia, with which the nævus is to be painted night and morning until ulceration takes place; and I find that the cure is effected in from three to five weeks. (Mr. W. J. Beatty, Stockton-on-Tees, British Medical Journal, Nov. 24, p. 1015.)

NASAL HEMORRHAGE.—*Plugging the Nose.*—For the arrest of nasal hemorrhage I know of no device so good as one that may be readily extemporised with a strong piece of cord and some small pieces of sponge. The cord is tied securely to a piece of sponge, cut rounded, and just large enough to be forced backwards through the nostril. Then a number of similar pieces of sponge, with a hole through the centre of each, are threaded successively on the cord. The sponge on

the end of the cord is then pushed, with a probe or dressing forceps, through the nostril, quite back to the faucial orifice; and the rest of the threaded pieces of sponge are slid back, one at a time, until the nares are tightly filled. When the patient becomes secure against a repetition of hemorrhage, the plugging is readily removed, one piece of sponge being withdrawn at a time, with the dressing forceps. The posterior nares may also be easily plugged by introducing either a slender gum (india-rubber) bougie or a piece of thick catgut string, with a cord attached, through the nares, catching one end of it in the fauces with forceps, and drawing it forward through the mouth. To the cord which follows, a piece of sponge or pledget of lint is tied, to be drawn up into the posterior nares. A method of making unirritating and painless pressure within the nares, in cases of obstinate epistaxis, is by a piece of the intestine of a chicken or other small animal, about twelve inches long, partially filled with either air or water. One end of the intestine is, while empty and collapsed, pushed backward through the nares; when thus lodged the air or water in the other end is forced, by compression with the hand from the pendulous portion, into the part lodged in the nares. Strong, equable compression can thus be made, rendering hemorrhage impossible. (Dr. R. J. Levis, Pennsylvania, Practitioner, Nov., p. 380.)

NASAL POLYPI.—*New Polypus Ring-Knife.*—The object to be attained is to detach the polypi as close to the bone as possible, and it is even better in some cases to remove a portion of the turbinated bones with them. It is generally tolerably easy to get away those polypi which hang near the anterior apertures of the nostrils, but for the complete removal of those more deeply situated the usual methods are often insufficient. To meet this difficulty I have devised the polypus ring-knife (made by Messrs. Krohne and Sesemann). It consists of a rod of softish steel (which allows of being somewhat bent to any desired curve) which, with the handle and the ring-knife, measures eight inches and a half. The handle resembles that of a door-key, and is large enough to admit two fingers; at the other extremity is the knife, of oval form and one inch and a quarter long, being at its widest part five-eighths of an inch broad. The outside of this ring is thick and blunt, its inside bevelled, and with a cutting edge extending round the semicircle farthest from the handle. The knife when used is passed along the lower part of the nostril with its sides parallel to the septum, until it reaches the posterior aperture of the nares. At the same time the forefinger of the left hand is passed behind the velum palati and hooked up in the posterior aperture of the nostril. If

there are any pendulous portions of polypus in the pharynx they can now, by a little manipulation, be slipped through the ring of the knife, which is then directed by the finger towards the outer wall of the nostril. The instrument is then slowly withdrawn, and, as it passes forward, is made to scrape away the polypi from their attachments to the bone. (Mr. W. Spencer Watson, p. 285.)

PURULENT PERICARDITIS.—*Paracentesis and Free Incision.*—When the pleura is obliterated and adherent to the pericardium the operation becomes much simpler. Then a spot may be safely selected as far out as possible, in the nipple line or even further, without any danger of opening the pleura. (1) Paracentesis pericardii is not only justifiable, but an operation which may be safely undertaken with ordinary precautions. One case only is recorded in which the operation was in itself fatal. With this exception all the patients were greatly relieved by the removal even of a small amount of fluid, and many recovered completely, who would probably have died if the operation had not been performed. (2) The most suitable place for puncture is, in ordinary cases, in the fifth left intercostal space one inch from the edge of the sternum, but if the pleura be adherent, the puncture may be made safely much further out, and even in the sixth space. (3) The instrument employed should be a trocar and cannula, with or without aspiration. (4) The operation may be performed with advantage not only in the pericardial effusions of rheumatic or primary origin, but also in those which occur in the later stages of general dropsy, if it should appear that the fluid in the pericardium is adding to the difficulties under which the heart is placed. (5) Purulent pericarditis is best treated on general principles, like an empyema. *a.* The pericardial sac may in these cases be safely opened and drained. *b.* This treatment moreover appears to be the only one which offers the slightest hope of recovery. *c.* The results are likely to be more favourable than those of empyema, for the walls of the cavity are better able to contract rapidly and thus permit of complete obliteration. (Dr. Samuel West, p. 187.)

THE VENOUS SYSTEM.—The veins form together a network of intercommunication. If you inject a tributary vein in any part of the body, as, for instance, of the internal mammary in the trunk or in the limbs, and in any direction either backwards or centripetally, the injected fluid (if thin enough for permeation) will fill every vein throughout the body, and extend into its finest ramifications. The macaque (monkey) exhibited is the proof to which I refer. You will observe

that there is no vein or vein twig that is not fully injected, and from that one point—viz., the internal mammary. This I conceive to be a new fact in connexion with the vein circulation. I have put its proof to the test by a considerable number of experiments, and in no one instance have I failed, provided the animal experimented upon was healthy. In order to prove the communications, even where these are apparently exposed to valvular interruption, as in the azygoids, its vessels must be injected by two distinct methods and from different points: first, forwards from an iliac, renal, or sacro-lumbar—a systemic, vein: and then after tying its trunk in another subject, backwards or in a direction opposed to the natural current, from the orifice of a remote collateral—e.g. an internal mammary, or internal jugular vein. I have caused these methods of injecting this department of the vein system to be adopted several times. In the first the injection will be checked by the valves at the junction of the thoracics with the intercostals, whilst in the second it will take a circuitous route and fill the void costal portions. The next point is that the injection in taking this course fills every interposing organic structure. It will traverse the lungs, liver, kidneys, and, as I have every reason to believe, the spleen, supra-renal capsules, the thyroid, and other organic structures. The third is, that it does not follow that because one large organ, such as the liver or even other parts or organs of the body, are thus injected, all should be equally so filled. In the case of a subject injected by Mr. Montille, the lobules of the liver were completely injected from the jugular and femoral veins, but no part of the fluid had passed into it by the portal vein. This vein was empty. And this is quite intelligible, for the course of the injection might be first through the superior, which receives the trunk of the inferior, phrenic, and passes by a single conjoint vein into the external hepatic vein and the liver. The phrenics anastomose freely with the lower intercostals, and thus the mammary blood can flow into the heart through the azygoids. The spermatic vein on the right side, as is well-known, passes into the superior cava, and on the left into the renal as well. The injection might also fill the inferior hemorrhoidal. This completes the proof that the whole of the vein blood from the nearest to the most remote parts of the trunk has free access to the hepatic globules without being dependent on the portal veins for its conduct, so that it would appear that these veins are not exclusively portal to that organ. By the network already alluded to, the liver is accessible to the vein-blood equally from all parts of the system. The bearing of this inquiry on physiological science is far from being remote as to its consequences. It shows that blood depuration

by organic textures does not depend so much upon the means of access to the liver and other depurating organs of the blood from every part of the body, as upon the healthy performance of their functions. Any interruption to either the first or second of these necessary conditions will be followed by marked local evidence, such as skin sallowness, corresponding with the area over which they have failed of being fulfilled. (Mr. John Gay, Lancet, Dec. 15, p. 1037.)

WOUNDS OF THE VESSELS OF THE PALM.—The introduction of Esmarch's bandage has revolutionised the older treatments of wounds of the palm. Its application admits of a studied and careful dissection in search of the bleeding point or points, which with ordinary anatomical knowledge and manipulative skill should be found. Tentative ligature of the radial, ulnar, interosseous, or even median, and the last severe resort of ligature of the brachial, are assuredly in the highest degree unwarrantable at an early stage. Added to which, if the operation be conducted on strict antiseptic principles, there is no dread of mischief after searching about in the palm. (Mr. E. Bellamy, p. 281.)

Hemorrhage from a wound of the palm can be controlled at the wrist. The simple application of an acupressure needle, either to the radial or ulnar, or even both if need be, will stop hemorrhage from a wound of the superficial or deep palmar arch. It is an operation that is readily performed, is attended with no danger, and seems in every way preferable to ligature of the brachial, which should be had recourse to only as a last resource. (A Practitioner, Lancet, Nov. 10, p. 843.)

AFFECTIONS OF THE RESPIRATORY SYSTEM.

ACUTE FEBRILE DISEASES OF THE RESPIRATORY ORGANS.—*Nitrite of Amyl.*—The author has employed this remedy for five years, and is well satisfied with his results. According to his experience, it is indicated and has good effects in acute febrile diseases of the respiratory organs, where weakness from old age and a high degree of dyspnœa endanger the life of the patient. The action of this drug passes off rapidly—in fact, it ceases when inhalation is suspended. In this manner it may be given for days, if necessary, without bringing on any bad effects. The author thinks the fear of properly employing nitrite of amyl is the reason of its failure in many instances. He applied it by putting five to twenty drops on a handkerchief, from which it may be inhaled, and repeated as often as may be necessary. (D. Anhona, Therapeutic Gazette, Nov., 1883.)

ANTISEPTIC INHALATIONS IN PHTHISIS.—In an advanced case of what I call the "refined" type of phthisis, in a girl of 15, the treatment consisted in the almost continuous use of an inhalation, at first, of eucalyptol and spirits of chloroform, subsequently of creasote and spirits of chloroform. She also had a mixture containing two minims of creasote, and two grains of quinine, with glycerine and mucilage three times a day. After a few weeks of this treatment she felt so well, that she begged to be allowed to return to her home, which was a comfortable one. Now, I do not think any one, nurses, as well as doctors, who saw this girl when she came into the hospital, thought she would leave it alive. She appeared to be sinking from rapidly advancing disorganisation of the lungs, and attendant constitutional disturbances. The effect of the antiseptic treatment in this case was not to cure the disease, or to restore the destroyed and broken down lung-tissue. To perform what, to our constant experience, seems impossible, is to perform a miracle, and we do not claim miraculous virtues for antiseptic inhalations. But what I claim for them, in this case, is, that they not only prolonged life, but that they quieted, in a remarkable way, the often most distressing advanced stage of this malady. By allaying all the most distressing symptoms, this patient's condition, which at the beginning of the treatment was a very miserable one, became a comfortable one. You might have seen her going about the ward quite cheerful and happy. (Dr. I. Burney Yeo, p. 199.)

Vaporisability of Carbolic Acid in Continuous Inhalation.—I have ascertained, by experiment, that in an inhalation-respirator, such as I am in the habit of using, and which I have described in my lectures, when worn, 2·5 grains of carbolic acid (mixed with twice its weight of spirits of chloroform) can be vaporised per hour; so that, if worn twelve hours out of the twenty-four, and many patients wear them all night, 30 grains of carbolic acid will be diffused into the air respired. It must be remembered the inspiratory current and the warmed expiratory current (often considerably better than in health) are constantly passing through the porous material, which is saturated with the material to be inhaled, and evaporation is thus promoted to a much greater extent than when the fluid to be inhaled is exposed, for a given time, to still cold air. It is easy enough, by various methods, to charge the air inspired with a larger quantity of carbolic acid, but for continuous inhalation many patients cannot tolerate a higher proportion. When the inhalation-respirator is not worn at night, a ready method of developing vapour of carbolic acid around the patient is to pour the acid

on an ordinary hot water-plate that has been filled with boiling water, and place it by the bed-side. In cases of *hooping cough*, I have had the atmosphere of the bed-rooms charged very thoroughly by combined dry and moist diffusion; the former by dropping the acid in a heated metal plate, an ordinary kitchen shovel does as well, and the latter by means of a large Siegle, or the admirable modification of Siegle, devised by Oertel, which may be had of Messrs. Squire, (Dr. Burney Yeo, Brit. Med. Journal, Jan. 19, p. 104.)

CHRONIC OZŒNA.—"*Colourless Iodine.*"—Carbolic acid bleaches iodine, and the colourless carbolate combines all the advantages of both base and acid. I have just seen a case of chronic ozæna, in which almost every-known remedy has been used and a small fortune spent in treatment, which included a visit to Royat for the douches, &c., and without avail, but which most wonderfully improved in a short time by douches at home of colourless carbolate of iodine. In these days of antiseptics the preparation has probably a wide and useful application. (Mr. Percy Boulton, Lancet, Dec. 10, p. 845.)

The easiest way to decolorise iodine is to add forty minims of a saturated solution of hyposulphite of soda to each fluid ounce of tincture of iodine. Forty minims of the saturated solution contains about thirty-two grains of sodic hyposulphite. (Mr. H. A. Lawton, Lancet, Dec. 1, p. 279.)

Colourless Iodine for Gargles, Nasal Douches, Vaginal Injections, &c.—Put into an open vessel a drachm of tincture of iodine and six ounces of hot water; add twelve grains of phenol and stir with a glass rod, when the solution will be at once bleached. Hot water is necessary, as phenol is not perfectly soluble in cold, and for this reason I do not advise the making of more concentrated solutions. It is possible that they could be made by heating a strong preparation of iodine, but the above is what I advise for gargles, nasal douches, vaginal injections, and the many uses of an admirable antiseptic. As it greatly removes local hyperæsthesis, it is most valuable in such conditions as acute tonsillitis, and is certainly, in my opinion, more efficacious than iodine alone. (Mr. Percy Boulton, Lancet, Nov. 24, p. 935.)

FUMIGATION AND ANTISEPTIC INHALATION FOR THE EAR, THROAT, AND NOSE.—*Eucalyptus, Carbolic Acid, Iodoform, and Ammonium Cigarettes.*—The value of chloride of ammonium in catarrhal states of the nasopharyngeal tract, and the drum-cavity of the ear, is widely known and acted on. The importance of disinfection, in the many conditions dependent upon parasitic infection of the nasal and aural passages, has been clearly established. The same remark applies to several

lung-changes, which modern research has shown have a similar relationship. The value of iodoform in syphilitic states is well known: in foul discharges from the ear and nose, otorrhœal and ozænatous, in catarrhal conditions of the naso-pharynx, often associated with the latter, its vapour and topical application as an ointment is now commonly employed. The general value of eucalyptus, in throat-affections, is evidenced by its universal application in the shape of lozenges and gargles: the inhalation of its volatile oil, in slight catarrhal attacks of the throat, larynx, and bronchial tubes, is attended by marked benefit, and oftentimes immediate relief. Carbolic acid has its universal reputation as an antiseptic in aural, nasal, pharyngeal, and pulmonic affections. With these facts before me, I have used with benefit in several cases cigarettes made, at my suggestion, by Messrs. Corbyn and Co. The basis of all is loosely powdered eucalyptus-leaf. The eucalyptus and carbolic acid cigarettes have sufficient of the oil to saturate the leaf, and half a grain of carbolic acid, in each cigarette. The iodoform have (the stronger) one-fourth of a grain, and (the milder) one-eighth of a grain, in each. The chloride of ammonium cigarettes contain five grains of the salt in each. The nasal passages can be freely exposed to the vapour by expelling it through the nostrils, by the ordinary trick of smokers. The vapour can be retained a certain time in the naso-pharyngeal space before expulsion. By Valsalva's method, the cavity of the tympanum may be inflated; and, in cases of otitis media and otorrhœal discharges, the aural passages may be subjected to the influence of the vapour. The cigarettes are not unpleasant to smoke. It is not necessary to point out the many other conditions in which these cigarettes may be employed, not merely in affections of the respiratory tract and pharynx, but where we desire to fumigate pleasantly the air we breathe. (Dr. Macnaughton Jones, British Med. Journal, Nov. 17, p. 980.)

LARYNGEAL PHTHISIS.—*Iodoform as a Local Remedy.*—Regular applications of iodoform in powder to the ulcerations of laryngeal phthisis produce *cleansing*, and in many cases *diminution in size, of the ulcers*, often *diminution of the surrounding œdematous infiltration, decrease of pain and soreness*, and *frequently considerable improvement of the dysphagia and odynphagia*, which had previously formed some of the most distressing and most serious features of the disease. Until we are in possession of a really curative remedy, I shall continue to use iodoform applications in laryngeal phthisis, and shall feel justified in recommending them. It goes without saying, that they are recommended in cases of ulceration

only, not in cases of simple œdematous infiltration or of impaired mobility of the parts. The formula I make use of is—℞. Iodoformii, acid. boracic., āā gr. j; morph. acetat., gr. ¼. M. f. pulv. D.S. Ad insufflationem. If circumstances permit, two such powders should be insufflated daily, one in the morning, the other in the evening. If this should be impossible one application must, and in most instances will, suffice. It is surprising how little local irritation is caused by the insufflation, even of pure iodoform. The patient ought to clear his throat before the application, and ought to hold his breath for a few seconds after it, when the involuntary reflex incitement to coughing will generally be gone. In conclusion, I do not consider it superfluous to insist on the necessity of making every application *under the guidance of the laryngeal mirror*. (Dr. Felix Semon, St. Thomas's Hospital Reports, p. 111.)

NIGHT-SWEATING OF PHTHISIS.—*Physostigma.*—Dr. Da Costa, of Pennsylvania, says, "In a man with advanced tubercular consumption attended with profuse night-sweats, two minims of fluid extract of physostigma were given; he was sweating at the time; his respirations were 30; the pulse, 120; the temperature 100°. In an hour afterwards the skin was almost dry; respirations were 24, the pulse was 104, the temperature 96°·6; it rose in two hours after this to 97°·8. There had been no unpleasant effect except great thirst. In another case we first noticed the sweating carefully, while a placebo only was given. It came on profusely at midnight, and while profuse the respirations were 32, the pulse was 122, the temperature 97°; the sweating lasted four hours; as it passed away, the respirations were 28, the pulse 114, the temperature 99°·8. At the same period of the next twenty-four hours, and when the sweating had fairly begun, although the temperature then was 99°·5, a dose of two minims of the fluid extract of Calabar bean checked the sweating in an hour and a half, the temperature rising to 100°·6. In a third case of marked phthisis with night-sweats, the temperature before the sweats at 3 p.m. was 100°·5; in an hour afterwards with a profuse sweat it had declined to 98°·6; four minims of the fluid extract were then given, the sweat was completely checked in an hour, the temperature rising to 99°; there was no decided effect on the pupil and no unpleasant symptom. In a fourth case the profuse early morning perspirations were arrested in two hours by the same dose, the pupils being slightly contracted, the pulse becoming less strong, the temperature declining from 100° to 97°·6." On theoretical grounds it might be supposed that physostigma would

be useful in the treatment of sweating. It is allied in its physiological action to jaborandi, pilocarpin, and muscarin, whilst it is antagonised by atropin, daturin, hyoscyamin, and homatropin. (Dr. Wm. Murrell, Practitioner, Dec., p. 401.)

PLEURITIC EFFUSIONS.—*Rapid Absorption by means of Common Salt, and cutting off Liquids.*—In a severe case of pleuritic effusion, I put my patient under the following conditions. He was to take every hour one tea-spoonful of common salt, dissolved in a wine-glassful of tepid water. I produced sweating by a hot wet flannel and a piece of waterproof sheeting, and I gave him two ounces of the common black draught at once, and stopped all fluids. The salt, I believe, increased the density of the blood; the blood became thirsty, if I may so express it, and drank up the pleuritic effusion in a manner to me singularly rapid and striking. Doubtless the sweating and purging aided me very much; but purging and sweating will not remove serous effusions with precision. (Dr. Tom Robinson, p. 198.)

PNEUMONIA.—*Nitrite of Amyl.*—Prof. Silvestrini, of Parma, formulates his conclusions as to the value of nitrite of amyl in pneumonia as follows: (1) In the pre-organic stage of pneumonia, the nitrite of amyl may be of prompt and effective service. (2) One may repeat with impunity the inhalation of this remedy during several successive days, and in doses relatively enormous. (He has administered as much as 50 grammes of the nitrite in five days, the inhalation being carried on for five minutes every half hour.) (3) In cases which have a fatal issue, whether from extension of the pneumonia, or from complications, these inhalations may retard death.—In the brief note of his experience with the nitrite four cases are recorded. In the case of a man, 59 years of age, suffering from double pneumonia which had reached its fifteenth day, the nitrite was commenced under the following conditions: Pulse very small, 120; respirations superficial, 44; temperature, 101·5°; stupor, cyanosis of the face and extremities, coldness of the point of the nose, and tracheal râle indicating the approach of a fatal termination. At the end of five minutes, during which 20 drops of nitrite of amyl were administered, the stupor appeared less, but the other phenomena persisted. The inhalations were repeated during the night, about 10 grammes being thus given. In the morning, pulse 120, respiration 64, temp. 101·3°, with less cyanosis, and signs of commencing resolution. With progressive improvement two days later the pulse was 96, respiration 36, and temp. 100°, and in a few days the patient was convalescent. (Glasgow Med. Journal, Jan., p. 67.)

AFFECTIONS OF THE DIGESTIVE SYSTEM.

BONES STICKING IN THE THROAT.—*Emetics.*—It is curious that in several of the best text-books on surgery, among the means used for dislodging bodies in the throat, no mention is made of emetics. A few months ago I had to make the discovery of their value in the following circumstances. On a Sunday morning, at about ten o'clock, a gentleman asked me to see his wife, who the previous day, about 2 o'clock, in taking some soup, became conscious that she had swallowed a piece of mutton bone, which quickly went so far down that it could not be felt by a medical friend whom she saw shortly afterwards. When I saw her, about twenty hours after the occurrence, I was equally unable to feel the foreign body, but the distress of the lady left no doubt of the presence of something in the passage exceedingly disagreeable. Swallowing was only accomplished with the most painful effort and in the smallest quantities. I had, fortunately, no forceps with me, and the case was urgent. It occurred to me that if I could reverse the action of the stomach and œsophagus by an emetic, I might procure the object in view, and save the necessity for using instruments blindly. I always carry a drachm of sulphate of zinc in my purse. The difficulty was to get the patient to swallow with any satisfactory quantity of fluid. It was only by dint of great and painful effort on her part, at my urgent request, that she managed to take half a drachm in a fair amount of water. As she was not predisposed to sickness, and at the end of five minutes had no sensation of the sort, I gave her a second half drachm with more warm water. In a few minutes free vomiting began, and the first act of vomiting was followed by a chink in the vessel and the presence in it of a piece of mutton bone with four sharp edges and four (especially two) sharp points. Shortly after this case I had two others of fish-bone in the throat. These were both small, and in neither could the bone be felt with a short index finger. In both I had recourse to an emetic with prompt and effectual relief. (Dr. James Gray Glover, Lancet, Oct. 13, p. 632.)

CONSTIPATION.—*Aloes.*—Aloes is especially useful in the fæcal sluggishness of sedentary persons. Properly given, the drug may be taken daily for years, without either losing its aperient efficiency, or producing any but the best results. I give one, two, or three grains of socotrine aloes in a pill, combined with a quarter of a grain of sulphate of iron, and one grain of extract of hyoscyamus, at bedtime every night. I find out, in each case, the exact quantity of aloes required to produce

one full alvine evacuation after the morning meal. In this combination, the quantity of aloes will need readjustment from time to time, usually in the direction of reduction. We are indebted to the late Sir Robert Christison, for the valuable suggestion of combining iron with aloes when we use aloes as a laxative. Neligan, in reference to the use of aloes in habitual constipation, wrote: "Christison states that the cathartic property of aloes is much increased by its combination with sulphate of iron, and that its irritating action on the rectum is counteracted by combining it with the extract of hyoscyamus, both of which statements my experience fully confirms." (Dr. Sawyer.)

Cascara Sagrada.—From my former experience of so-called new drugs, I have learned to employ such preparations with much caution, and to recommend them with more. But I now venture to state that I have used cascara sagrada in two or three cases of severe habitual constipation with marked success. I have given from fifteen to thirty minims of the American liquor thrice daily, adapting the dose by the result, and endeavouring to secure one, or at most two dejections, in each twenty-four hours. (Dr. James Sawyer, p. 208.)

Castor Oil and Glycerine.—Dr. William Soper claims that glycerine increases the purgative power of castor oil when given with it. A preparation combining, but not mixing, these two substances is active in teaspoonful doses. In the Pharmacopœia of the Hospital of the University of Pennsylvania is the following formula, which we believe is Prof. H. O. Wood's:—*Mistura Olei Ricini.*—℞. Ol. ricini, f℥j; glycerini f℥j; ol. menthæ piperitæ, gut. ij. (New Remedies, Nov., 1883.)

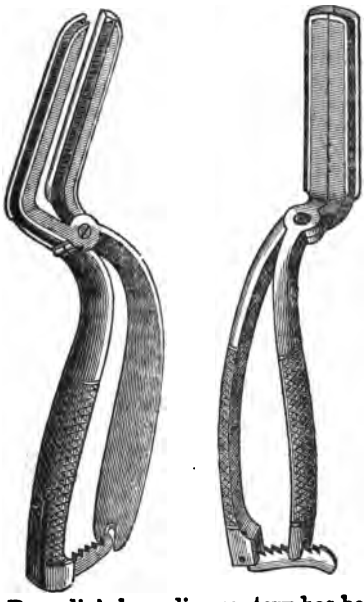
Saline Cathartics.—They all tolerably closely agree in the ultimate effect they have on the alimentary canal and the body generally. They cause no irritation or inflammation of the canal; stimulate but in the smallest degree the secretion of the more important digestive juices, as the gastric, the pancreatic, and the biliary; have, under ordinary circumstances, little action on the blood; and mainly act by increasing the intestinal secretion, and by hindering the absorption of the intestinal fluid. Their purgative action is therefore extremely simple. They sweep out the contents of the alimentary canal with the least possible disturbance of the digestive system and of the other systems of the organism. Few other purgatives, if any, have so simple an action. The value, therefore, which has long been assigned to them in the treatment of the occasional disturbances of digestion,

to which almost every one is at times subject, and where the indication seems to be to empty the canal "*cito, tuto, et jucunde*," is quite justified by the results of this investigation. (Dr. Matthew Hay, Practitioner, Nov., p. 377.)

DENTAL CARIES.—*Solidified Creasote.*—Creasote is a popular remedy much in use for toothache and caries of the teeth. Its fluidity sometimes causes serious oral accidents, but which can be remedied by solidifying it with collodion—two parts of collodion to three parts of creasote. A gelatinous mass is thus obtained, which is plastic, and with which the cavity of the tooth can be obdurated, which prevents the access of air, and influences the dental nerve. (Dublin Journal of Med. Science, Feb., p. 190.)

FISSURE OF ANUS.—I remember the mother of a large family, who was suffering from fissure, once saying to me that she would rather bear the pain of giving birth to a child than that incurred by the act of defecation when the bowels were confined. There is no doubt the suffering is great; and it is aggravated under distension by the rigid contraction of the sphincter consequent on its morbidly excited reflex action. Happily the remedy is simple and sure. It is a singular circumstance that the fissure is so usually in the coccygeal border of the outlet. Why this is so I do not know, except it be that there is less redundance of cutaneous texture here; certainly its presence at any other part is quite exceptional. In operating it is not necessary to cut into the fissure, though it is desirable to cut near it. I have never forcibly dilated the sphincter so as to split the fissure, for I do not recognise any advantage in this coarse mode of operating. The fore-finger of the left hand having been first introduced into the bowel, a straight and very narrow bistoury with a button-point is introduced along the palmar surface of the finger; its edge being then turned towards the bowel, the cutting is done in withdrawing it. The incision need not be very deep, but should be carried with tolerable freedom outwards, so as to divide the skin of the verge and the inner fibres of the cutaneous sphincter. A shred of lint may be laid in the wound for twenty-four hours, but it is scarcely necessary. These fissures are often quite out of sight, but can generally be felt; the contraction of the sphincter hides them. It is foolish to temporise with this condition; caustics torture without curing. I have known suffering like that caused by fissure as the consequence of a thread-like band crossing the back edge of the anus, but this would be readily detected if it existed. I have never had to operate a second time. (Mr. F. Le Gros Clark, St. Thomas's Hospital Reports, vol. 12, 1883, p. 29.)

HEMORRHOIDS. — *An Improved Pile Clamp.*—Mr. Henry W. Freeman, F.R.C.S.I., Surgeon to the Royal United Hospital, Bath, has produced an improved pile clamp, the shanks of which are made very stout and cranked at a right angle, the joint being arranged to allow the blades of the instrument to retain their parallel position, however widely opened. A self-acting spring-rack and pinion is fitted to the extremities of long eight-inch handles, and immense crushing power in the blades can be produced and maintained as long as desirable during an operation. One of the blades is furnished with a raised serrated rib on its inner margin, and this fits into a longitudinal groove in the corresponding margin of the opposite blade, and the flat surfaces of the blades are faced with ivory in the usual manner. The clamp has been made in two sizes, the blades of the larger instrument measuring three inches and three-quarters in length, an inch in width, and a quarter of an inch in thickness, and is capable of crushing completely external piles. The smaller one, measuring three inches by half an inch, has been used only for internal piles, and has but little crushing power.



Paquelin's benzoline cautery has been used at a dull red heat in connexion with these clamps, the stump of the pile being generally cut off level with the blades, without secondary hemorrhage occurring in a single case. The smaller clamp for internal piles has been used with Craddock's widely fenestrated rectal speculum. In ovariotomy and operations for nævi these clamps will be found also of service. They are manufactured by Hancock, of Westgate Street, Bath. (Lancet, Jan. 19, p. 120.)

HERNIA.—The most dangerous cases are those of sudden descent resulting from violence; early operation can alone save them. Operations for umbilical rupture, especially if large, are attended with more risk than for the inguinal or femoral form.—The employment of the taxis requires tact and delicacy; the former can be acquired only by experience; without the latter infinitely more harm than good may be done. Rough manipulation, purgatives, and temporising delay account for a large percentage of the fatal cases of herniotomy. I attach very little value to any of the adjuncts to the taxis, which involve delay. I have tried the warm bath, the local application of heat and cold, the administration of opium, but without much encouragement, and with the certainty that precious time is lost thereby. I have succeeded occasionally in reducing a hernia by raising a patient so as to place the pelvis considerably above the level of the shoulders. The principle is sound, being the substitution of traction by the weight of the viscera, for pressure on the limited surface of the rupture. But I believe the golden rule should be, to give a fair trial to the taxis, and if you fail, then to operate.—I generally have dissuaded my patients from taking chloroform, as the complication of after-sickness is serious. A simple straight incision over the neck of the tumour generally suffices; formerly it was the practice to divide the skin by a T-shaped incision, or by two incisions meeting at an angle.—Not infrequently some nodules of fat, external to the sac, so closely resemble omentum that they are likely to deceive the young operator. Intestine may generally be readily distinguished by the arborescent distribution of its vessels. For the division of the stricture I have employed a guarded knife, which likewise acts as a director.—I have operated subcutaneously, and also without opening the sac, in several instances. The former operation may be available in a few cases of very recent strangulation without urgent symptoms. The latter, except in such instances as those just referred to, I entirely discarded. I think the advantage supposed to pertain to this particular form of operation is imaginary; the fallacy consists in assuming that the condition of an inflamed hernial sac and of healthy peritoneum are identical. The fact is that though a healthy serous or synovial membrane is very susceptible under the influence of exposure to the air, they cease to be so when already in an inflamed or otherwise morbid state. So far as I can judge from my personal experience, opening the peritoneum forming the sac of a strangulated rupture adds nothing to the risk of the operation, whereas there may be great peril in returning its contents without inspection;

and surely the inflammatory product within the sac must be more prejudicial by contaminating the peritoneum than simple exposure of its interior, to say nothing of the after-drainage. It is very important, where the condition of the parts renders it probable that there will be a free discharge, to arrange that it shall not be retained or forced back into the abdominal cavity; as a choice of evils I would rather leave the wound unprotected save by a light poultice or water dressing than entirely block the opening.—The most careful search should be made in obscure cases; an old and adherent omental hernia may apparently fill the sac, without any unhealthy appearance to account for the urgency of the symptoms. But behind and hidden by it may be a very small knuckle of intestine, which is the seat of all the suffering. On more than one occasion I have operated and found nothing but healthy omentum in the sac, though the evidence of acute strangulation was present. I believe that in these cases a small knuckle of intestine had been strangulated, and returned possibly during the operation, as the neck of the sac by no means tightly grasped the omentum within it.—I think it is a safe axiom to act upon, that when in doubt it is right to operate. There is but small risk in operating unnecessarily, whereas your patient's life may be jeopardised by abstinence from interference, (Mr. F. Le Gros Clark, St. Thomas's Hospital Reports, 1883, p. 21.)

Strangulated Hernia.—In operating, I like a long skin-incision; it gives you plenty of room, and lets you see what you are doing; and all your subsequent incisions should correspond in length to your skin-incision. When the strangulation is of several days' duration, I like to open the sac and see the contents; also when the symptoms of strangulation have been very acute from the first. Although the stricture is frequently external to the sac, yet the neck of the sac itself may form the stricture. Adventitious bands may remain inside; and as length of time is not an absolute criterion as to the state of the contents of the sac, but rather the tightness with which the bowel has been caught, you cannot tell with certainty when to open the sac and when to leave it unopened. In all cases of femoral hernia, I would be inclined to open the sac, as it is in this form of hernia we frequently meet with omental sacs strangulating the bowel. In seventeen of my cases the sac was closed by catgut sutures, as recommended by Mr. Southam of Manchester. I have much confidence in the plan, as no doubt it diminishes the risks of inflammatory changes proceeding from the superficial structures to the sac. The sac, after reduction of the bowel, has been ligatured at the neck, and cut off in four cases, with

good results; and the method so highly spoken of, last year, by Mr. Banks of Liverpool, of removal of the sac, and stitching the pillars of the ring, has been used successfully in two cases. I quite agree with Mr. Banks, that "radical cure should form a necessary part of all operations for strangulated hernia." (Dr. J. Walton Browne, p. 297.)

Radical Cure of Hernia by Peritoneal and Intercolumnar Suture.—The plan which my colleagues and I in the Richmond Hospital have of late adopted in suitable cases, is not the application of a ligature *en masse* round the neck of the sac, or this procedure coupled with excision of the sac below the ligature, but, I believe, a simpler and, at all events, equally efficacious procedure. It consists in the insertion through the opened neck of the sac, and close up to the external abdominal ring, of a deeply-inserted carbolised catgut suture or sutures, according to the size, width, and depth of the neck; and this is followed by the approximation or closure of the canal and pillars of the ring by the insertion of two or more sutures of a stronger and more durable material, such as chromicised catgut, carbolised silk, or silver wire. It is, in fact, a dual system of suture, one being peritoneal and the other intercolumnar. I believe that in the great majority of cases this procedure will be found to be attended with satisfactory results, always provided that rigid Listerian antiseptic precautions are taken during and subsequent to the operation. (Prof. William Stokes, p. 287.)

Radical Cure of Hernia by the Direct Method.—Prof. Gross of Philadelphia thus describes this operation as practised by him:—"The most rational radical treatment of hernia is undoubtedly the direct, as it may be termed, consisting in cutting down upon the parts, refreshing the edges of the opening of descent, and approximating them with wire sutures, retained either permanently or until complete consolidation has been effected. The operation, it will be perceived, is founded upon the same principle as that for harelip and cleft palate, and will, if properly executed, be much more likely to answer the purpose than the process of invagination, now so much in vogue, and for the most part so worthless." Prof. Gross had performed this operation twice, with encouraging success. The special features of this operation are:—First, it is open; the surgeon sees exactly what he is doing, and can, with certainty and precision, draw the pillars of the ring into close contact. Secondly, it closes the opening through which the hernia descends at its abdominal aperture, and not in the canal. Both of these are important points which recommend the operation as one likely to fulfil

the requirements of the case; and if we can add from experience, that it is at once safe and permanently successful, then we have all we can desire in the way of an operation for the radical cure of inguinal hernia. (Mr. J. K. Barton, p. 293.)

Excision of Sac by Galvano-Cautery, and Union of Sac to the Pillars.—My method is as follows. An incision is first made much the same as in the operation of kelotomy, except that it is longer. The superficial integuments are now retracted, and the rings exposed to view. The intestines being fully returned within the abdominal cavity, the old protruding sac is excised by the galvano-cautery to a level with the pillars of the ring. The edges of this sac are now seized with serrated forceps in the hands of an assistant, care being taken not to bruise the edges. The operator now, with animal ligatures that have been thoroughly carbolised in oil, draws the two edges of this sac together by a continuous suture, leaving the ligatures long at both ends. The assistant holds the sac by these ligatures, instead of by the forceps, while the surgeon thoroughly freshens the pillars of the rings with the red-hot cautery. The pillars are next brought together, and the sac allowed to lie just beneath but in contact with them. A needle armed with silver wire is now passed deeply through the columns of the ring, and at the same time through the edges of the sac that are excised. This operation is repeated until sufficient sutures have been put in to draw the pillars well together. These sutures are then tightened either by twisting or by tying. The latter is the method that I prefer, because I can better judge the amount of tension, and am not so likely to produce a strangulation of the tissues. The ends of the carbolised ligatures are now cut off; the silver wire is smoothed down so as not to cause irritation, and the external integuments are stitched together with silver wire or silk. All that is needed to complete the operation is a compress of cotton, treated with either thymol, boracic acid, or carbolic acid; and the application of a common spica bandage. The distinguishing features of this operation are the excision of the sac by the galvano-cautery, the freshening of the edges of the rings by the same instrument, and the stitching of the sac and pillars of the rings together. By means of this freshening of the rings with the cautery, and the union of the sac to the pillars, an abundant exudation of plastic material is thrown out, and a great increase in the strength and consolidation of the new tissue is produced, so that the results of the operation are rendered very permanent. (Dr. Joseph H. Warren, British Med. Journal, Nov. 10, p. 914.)

Radical Cure of Hernia in Childhood.—The Open Method.—This consists of the usual operation of herniotomy, with ligature of the sac at the innermost point of the neck—*i.e.*, at the internal ring. An incision is made, beginning a little above the internal ring and in the direction of the herniial protrusion for about three inches. The coverings of the hernia are successively cut through till the sac, which is kept distended by the hernia, is reached. The sac is then separated from the cord, and freed from the surrounding structures as high up as possible. A ligature of stout catgut, treated with chromic acid, is passed round the sac by means of a blunt aneurysm-needle; and, while the sac is well drawn downwards, its contents having been reduced, the ligature is firmly tied once or twice as high up as possible, and cut off short. Though I have not, in most of my cases, cut the sac below the ligature, still I think it advisable to do so, as the occlusion is more likely to be complete, and the part above the ligature slips easily into the iliac fossa. I have never followed Nussbaum's recommendation in removing the whole sac, as, having vital connections with the surrounding parts, it will not slough; and in congenital cases it is so intimately connected with the testicle, that it cannot be removed without excising that organ. It is, however, very important that it should be thoroughly drained; otherwise much swelling, and perhaps suppuration, will take place. I prefer a tube or horse-hair drain, passed into the sac through the upper part of the incision, and through a counter-opening in the lower part of the scrotum behind. If the sac be not cut through, it should be opened below the ligature, and drained in the same way. I do not consider it necessary to bring the pillars of the ring together in all cases; I have only done so where the opening was very large and lax, and the pillars of the ring remained widely separated. In other cases, it is unnecessary, except as a matter of precaution; because, as Mr. Rushton Parker remarks, when the sac is tied—the hernia thus prevented from coming down—the pillars fall together easily, and remain as tightly as could be wished. A strong curved and handled needle, with the eye at the point, and carrying a chromic catgut ligature, is passed through the external pillar of the ring below and behind, and through Gimbernat's ligament and the conjoined tendon. It is then tied firmly, and cut short. Mr. Banks recommends a silver ligature, which is left covered in. Still I think the catgut ligature will answer the purpose equally well. The lips of the wound are lastly brought together by silver sutures. Strict antiseptic precautions are maintained all through, the spray being used during the operation, and gauze dressings afterwards. As a

rule, the cord can easily be separated from the sac; but, in congenital hernia, it sometimes happens that the cord is so intimately connected with the sac, and perhaps runs through the sac, that it must be included in the ligature. In two cases, I was unable to follow the cord up from the testicle. In cases of undescended or imperfectly descended testicle, the cord and hernial sac may be tied together and the testicle removed, as the testicle, being often undeveloped, is hardly worth preserving. (Mr. R. N. Pughe, British Med. Journal, Nov. 10, p. 915.)

Radical Cure of Hernia.—The radical cure of hernia has, until within the last few years, been a comparatively rare operation. Five years ago Wood's operation was occasionally performed, and Wutzer's operation only served to test the knowledge of the student. In the Liverpool Medical Society, on Dec. 20, a discussion which arose on a paper on this subject by Mr. G. G. Hamilton elicited the fact that within the last three or four years about 150 radical cures have been performed by the surgeons of that city. Mr. Banks has performed between 50 and 60, Dr. Alexander about 30, Mr. Rushton Parker 28, the Surgeons of the Northern Hospital 14, whilst Messrs. Pughe, Rawdon, and others have operated on smaller numbers. The mortality has been *nil*, and the successes highly satisfactory to all as far as time has enabled them to judge. The operation consists in tying the neck of the sac, and severing the neck thus tied from the rest of the sac. Mr. Rushton Parker stops here, and has had a success quite satisfactory to himself. Dr. Alexander adopted that method for a time, but he now joins all the surgeons in dissecting out the severed sac, because it makes the cicatrix firmer and gives a better support to the ligatured neck. In inguinal hernia especially, and to a certain extent in every variety, all the surgeons who spoke, with the exception of Mr. Parker, bring together by suture the fascial boundaries of the opening, which in inguinal hernia are formed by the pillars of the ring. Mr. Parker would only do this in exceptional cases. As to the material to be used for tying the neck of the sac and suturing the pillars of the ring, there was wide diversity of practice. In the Northern Hospital cases which were performed by Mr. Manifold, Mr. Puzey, Dr. Macfie Campbell, and Mr. Damer Harrisson, chromic catgut was generally used for both purposes. Mr. Banks ties the neck of the sac with chromic gut, and brings the pillars of the ring together with silver-wire sutures, which are to be retained indefinitely. If the sutures irritate, all the better, as they can then be removed. If they do not irritate, it is still well, as they will always maintain their hold. Dr. Alexander uses

catgut for the neck of the sac, and silver-wire sutures for the pillars of the ring. He removes these sutures before the wound closes, and looks with favour on healing by granulation. Mr. G. G. Hamilton recommended fishing gut or sulphurous gut for both purposes; and Mr. Rhinallt Pughe spoke highly of the latter as being pliable and making a firm knot. It was therefore evident that good results could be obtained by any of these methods, and that the kind of suture was not essential. This method of radical cure is capable of being performed in all kinds of hernia, reducible or irreducible. In all cases, the sac, having been dissected out from its surroundings, and especially from the cord in male inguinal hernia, is opened, and, if irreducible, the contents explored, the adhesions severed, and omentum removed if necessary. Mr. Banks and Dr. Alexander have successfully removed great masses of adherent omentum in this manner. In reducible hernia the sac is always opened, to see that the hernia is *completely* reduced. This free opening of the sac is not, therefore, new in Liverpool, although Mr. Lawson Tait puts it forward as a new practice in Birmingham. Mr. Banks described in great detail the cases suitable for operation. It need not be performed in young children except under exceptional circumstances, as a truss generally cured such cases before puberty was reached. The exceptional circumstances were a very wide opening, or the presence of the disease debarring an orphan from a charity school, or inability or dislike to wearing a truss. In adults it should only be performed in omental hernia and in hernia complicated with undescended testis, on account of the exceptional danger of such cases. In ordinary cases of reducible hernia he would not operate unless life was rendered miserable by the disease, or the patient was thereby unfitted for work. When a well-fitting truss completely relieved the patient, he would not recommend an operation. As to the after-treatment, all agreed upon the advantages of a prolonged rest in bed for at least three weeks. Some of Mr. Parker's cases were up in ten days, and others in fourteen days, and he now believes that these periods were too short. In most of the cases no appliance was used afterwards. Mr. Banks, however, recommends a light truss to be always worn after operation. He does not believe in a *radical cure* of hernia in the sense of the patient being as strong in the region operated on as a perfectly healthy man would be. The wearing of the truss is no discredit to the benefits of the operation, and is an additional security to the patient. The results at the Northern Hospital were, up to the present time, ten cures and two failures. In two cases the interval was under six months,

and therefore the question of cure could not be entertained; they had not failed. The dressing varied as much as the kinds of ligature and suture. Mr. Rushton Parker first introduced the operation into Liverpool, and thought the idea was new to others as it was original with himself. He afterwards found that it had been performed by Dr. Macleod, of Calcutta, by Drs. Annandale and Buchanan, and by some others. In the successful and frequent application of the operation it will be seen that Liverpool occupies an exceptional place. According to some writers in the medical journals, the operation is almost unknown in many places. (Editor of Medical Times, Dec. 29, p. 745.)

Resection of Portions of Intestine.—Resection has now been practised upon all parts of the intestinal canal from the pylorus to the rectum. In resecting portions of the small intestine the abdomen is opened in the middle line below the umbilicus. When the peritoneum has been divided, and the diseased part is being searched for, some protrusion of the distended gut is very usual. It is most desirable that this protrusion should be prevented. With care the intestines can be retained by the application of large carbolised sponges, and by puncturing the distended bowel in several places with a capillary trochar. This pricking I have practised without ill result in three cases of laparotomy for intestinal obstruction. When the diseased part has been dragged out of the wound, it becomes necessary to control the gut above and below to prevent extravasation of fæces when the resection is performed. This control of the bowel has been effected in many ways. By some it is advised that a partial union of the bowel should be effected before the preparations for an intestinal fistula are made. Of the other methods available there are Jobert's invagination process, which consists of invaginating the upper into the lower end of the completely divided intestine and then stitching together the serous surfaces, and Maisonneuve's plan of "intestinal anastomosis," where the divided small gut above the obstruction is joined to some part of the colon. Neither of these processes, however, would appear to have been applied to the human subject. There remains the method of directly uniting the two ends by suture, returning them into the abdomen and closing the parietal wound. The difficulties in the way of this last and perhaps most desirable method are numerous. The two ends of the gut have to be kept in accurate apposition while the sutures are being inserted. The corresponding parts of the two portions of the bowel must be precisely approximated. Any sudden movement of the parts may cause the

sutures already inserted to tear out, and the relation of the divided ends to be disturbed. Moreover the intestine operated upon is lax, flabby, collapsed, and empty, and the accurate adjustment of sutures to such a structure is a matter of considerable difficulty. A still further obstacle is found in the fact that the gut above the occlusion is usually much dilated, while that below it is narrow and shrunken. The two cut ends under these circumstances are so disproportionate in size that the union of the two by suture becomes a problem somewhat difficult to solve. As the operation of resection, however, at present stands, it must be confessed that the best results have been obtained in those cases where the excision has been followed by the formation of an artificial anus; and, on the other hand, little encouragement has been offered for the performance of direct apposition of the divided ends and the replacement of the bowel within the abdomen. This latter procedure has failed from gross faults in the details of the operation, and if those faults be remedied I see no reason why this method should not surpass in its completeness and in the certainty of its results the plan that involves the formation of a temporary or permanent intestinal fistula. (Mr. Frederick Treves, p. 300.)

Resection of Intestine.—Resection of the intestine in the region of the colon and small intestine, in which the connexion with the abdominal wall is not close, and the tissues on the whole are healthy, is naturally a much less formidable operation than when it is performed for the relief of disease of the pyloric end of the stomach or the duodenum, as the opposing ends of the resection can be readily brought together without strain on the uterus. But so far as I can find, it has not been frequently had recourse to in cases of surgical emergencies. Prof. Wahl of Dorpat reports two cases, one of which was performed to heal an artificial anus, the other to avoid, if possible, the return of malignant disease in the descending colon in an operation for the removal of a dermoid ovarian cyst. The former failed through the giving way of two stitches; the latter was practically a success, though the patient died two months afterwards from malignant disease. The special difference in operating between these two cases was that two rows of interrupted stitches were used in the latter and one in the former. When the two rows were used, the mucous membrane and muscular wall were secured in one row and the serous membrane in another. Now, it appears to me that it depends more upon the quantity of the stitches in a case where we have so little surface to deal with than upon the arrangement of them so far as regards the various

tissue layers. In my own case I acted on a hint obtained from reading a case recorded by Sir Spencer Wells, who, having accidentally wounded the large intestine in the removal of an abdominal tumour, sewed up the gap with a continuous suture. I believe that in such a case the continuous suture secures more accurate apposition than the interrupted suture. But the stitches must be put in very near one another, and so as not to include any portion of the mucous membrane between the free edges. This case, however, proves that complete patency of the intestinal canal can be secured after six or seven inches of the small intestine have been resected, and ought to be at least a ground of encouragement to the surgeon in case of accidental injury to the bowel during operation, and probably also an inducement to undertake laparotomy for the removal of serious disease, such as extra-uterine fœtation, even though the bowel may be believed to be to a certain extent involved. (Dr. Angus Macdonald, Lancet, Feb. 9, p. 249.)

AFFECTIONS OF THE URINARY SYSTEM.

CATHETERISM.—*Risks of Catheterisation in the Aged.*—If a patient has been in the habit of retaining perhaps a pint of urine, or even more, after he has made water, it is a serious change for the bladder to be suddenly and completely emptied two or three times a day; the organ soon becomes irritable, the urine is charged with pus, and the patient loses appetite, becomes feverish, and there is sometimes considerable danger to life. The rule under such circumstances is to proceed cautiously. Instead of removing the entire quantity, leave some urine behind; and thus a compromise is made between the exigencies arising in this condition of the bladder, and the usually absolute rule that it should be emptied. Draw off half or only two-thirds of a pint; you will thus relieve the organ partially, and in the course of a week or sooner you may gradually accomplish the entire emptying of the bladder, and all will probably go well. When the bladder of an elderly man fails to empty itself, let him learn to use a soft catheter without much delay: thus life with comfort may often be maintained to its natural term. Neglect the catheter until chronic disease of the organs is established, and a catastrophe may then be hastened by the use of the instrument. Scores of men whom I know in this town, between sixty and eighty years of age, still active, mature in mind, and more than ever serviceable to their fellows, owe their existence entirely to habitual catheterism. (Sir Henry Thompson, p. 306.)

Castor Oil as a Lubricant in Catheterisation.—Suffering myself from prostatic hypertrophy in the stage wherein the use of the catheter is required, I was till quite recently unable to establish tolerance of the instrument. Even the limp caoutchouc catheter gave rise to irritation, which was followed by attacks of orchitis and a permanent state of mild catarrh of the bladder, the lubricants used being olive and almond oils, cold creams, and vaseline. Feeling dissatisfied with all these smearing substances, I bethought me of trying castor oil, and from the very first application have derived therefrom signal advantage. Owing to its viscidity and tenacity, castor oil is carried upon the catheter down to the prostatic portion of the urethra and to the neck of the bladder, whereas other substances leave the extremity of the catheter long before those parts are reached, the instrument being thus deprived of smear just where it is most wanted. After ten days' use of the new lubricant, the testicles have become normal and the urine almost free from mucous deposit. At first I had some fear of acridity in the castor oil, but experience has shown that it is entirely free from irritating principle. (Dr. J. B. Mitchell, Paris, Lancet, Feb. 9, p. 283.)

EXPLORATION OF THE BLADDER. — The operation consists in opening the membranous urethra from a small median incision in the perineum, and in dilating the prostate gently and gradually with the left index finger, which when fully introduced explores the entire internal surface of the bladder, while supra-pubic pressure is made under complete anæsthesia. The way is thus made for the introduction of the forceps. Of these I have designed and employed two or three forms, and found them useful to meet varied forms of growth; and some of these are now provided with cutting edges. I may remark that while in some cases the prostate is dilatable, and admits the finger without receiving much if any injury, in others a certain degree of rupture is inevitable. This I have recognised during life, and have witnessed in two of the fatal cases; but the division of tissue thus produced is not considerable. When an adult, either male or female, has long been the subject of unduly frequent micturition, the act mostly painful, with occasional hæmaturia, this sign increasing gradually in importance as the case advances, and furnishing evidence meantime that its source is vesical and not renal, a physical, *i.e.*, surgical examination of the organs is of course indicated. The result of this may show that no calculus is present, and that no obvious enlargement of the prostate or of the adjacent structures can be affirmed. Nothing in the history can be distinctly referred to as a cause;

no clue in fact is offered, except such as may be found by repeated examination of the urine. And it is by this particular means that the most trustworthy information is to be obtained. (Sir Henry Thompson, p. 318.)

FISTULÆ IN THE URETHRA.—If the urethra is opened behind the scrotum, and a catheter kept constantly in the bladder through this opening, all difficulties are obviated. The urine flows away without any pain or discomfort to the patient, and a certain amount of cystitis is not incompatible with success. The operation is a very trifling one, as the membranous portion of the urethra is alone incised, and a catheter introduced into the bladder through this opening cannot be attended with greater risk than when it is lying in the whole length of the urethra. In addition to all this there is one great advantage. There is no risk of urethritis in that part of the canal in which you wish to perform the plastic operation. The urethra in front of the scrotum is left entirely free from urine, and there is no constant source of irritation and consequent inflammatory exudation, such as naturally follows upon tying a catheter into the whole length of the urethra, or even such as must in some cases result from passing a catheter as often as may be necessary to relieve the bladder. Constant catheterism must disturb the parts which you are striving to heal, and in some patients would infallibly produce a copious purulent secretion. Again, if there be a certain amount of cystitis, the patient is by no means in a worse condition with a "vent-peg" in his perineum. If cystitis be present before the operation, he will probably be relieved; if set up in an irritable subject by the operative manipulation, little though it be, it very soon subsides, and one may have, I think, the consolation of believing that he never would have stood the constant catheterism which is the only other alternative. In a case related, on Nov. 3rd, a fortnight after the preliminary opening in the perineum, the patient was placed under the influence of an anæsthetic, and both fistulæ closed by quilled sutures. The edges were of course thoroughly pared down to the urethra, and in the case of the posterior fistula the lining membrane of a cavity which led from the urethra into the scrotum, and secreted a considerable amount of muco-purulent fluid, was dissected out. Silver sutures were passed down one side of the raw surface across the urethra and out on the other side without appearing in the wound. They were then attached to quills and the flaps brought together, the edges of the skin between the quills being also sutured with catgut. The method employed was therefore similar to the operation for ruptured

perineum, and was of the simplest kind. There was no flap from a distance or sliding operation, but a simple straight incision down the middle brought together with two pairs of quills. (Mr. H. H. Clutton, p. 314.)

HEMORRHAGE FROM THE URINARY ORGANS.—*Gallic Acid.*—In chronic bleeding from the surface of the mucous membrane of the pelvis of kidney, ureters, bladder, and urethra, and from villous growths, as well as in the very obstinate hemorrhage from large fungous tumours of the kidney and bladder, I have found gallic acid most valuable in a large number of cases, and for some years past I have been led to depend upon it more and more. In that spongy condition of the prostate when the veins are large and the capillaries of the surface considerably dilated, and forming here and there little pouches like aneurismal dilatations, hemorrhage is often not only very obstinate, but from time to time in such excessive quantity as to blanch and weaken the patient. The remedy should be given in frequent doses day and night until the bleeding is very decidedly reduced in degree, when it may be ordered once in six hours, or less frequently, being again increased in frequency if the patient ceases to improve or the hemorrhage again increases in severity. The glycerine of gallic acid is the most pleasant form in which to prescribe the remedy. This contains one part of gallic acid in four. Forty minims will contain ten grains, and may be given in distilled water, peppermint, orange, or other water. But it is most essential that the patient should persist in taking the doses regularly for several days. I have given gallic acid in ten-grain doses every three hours without intermission for three weeks, no objection having been made on the patient's part. (Dr. Lionel S. Beale, Lancet, March 15, p. 466.)

LITHOTOMY.—The instruments I have used are a staff with a moderate curve of about three inches, and a rather broad scalpel, with a button point, which moved freely in the groove. I dare say the long curved staff has its advantages, especially in leaving the left hand at liberty to guide the knife. But, from habit, I prefer taking the staff into my own hand; the harmonious action of the two hands in the incision of the prostate, when acquired, seems to me to leave nothing to be desired. I was satisfied with the incision my scalpel made, and did not incise the prostate further. But one precaution I always took, which was to withdraw the knife slowly, with its edge pressed gently against the lower part of the wound, so as to secure entire division in this direction of every intervening filament of tissue which might interfere with free drainage, probably one of the most im-

portant precautions in the operation. I did not introduce a drainage tube, but allowed the urine to pass by the wound. A tube is required where it is necessary to plug the wound to arrest bleeding; but, except in this case, I regard it, as I do all foreign bodies in a wound, as prejudicial. The passage of the water over the incised surface helps to seal the open mouths of the vessels, and the healing process goes on without disturbance. I may here remark, incidentally, that my practice in cases of extravasation of urine has been guided by the same principle, that of allowing drainage by the wound. A catheter may be useful in some exceptional instances; but until the healing process is considerably advanced I am satisfied the presence of a catheter is not only useless but positively injurious. It does not appear to me that there is any essential improvement in lithotomy since Cheselden's time. I have never performed any but the lateral operation, and I have never had occasion to divide both lobes of the prostate, though I extended my incision, with a straight button-pointed bistoury, on two or three occasions during the extraction of the stone. I believe that success in the removal of a large stone very much depends on the patience of the operator; irremediable mischief is occasioned by force, and there is even less excuse for haste now anæsthetics are used than in the earlier period of my practice. The yielding property of the prostate is well known, but its violent laceration may be fatal. I remember a conversation I had with Mr. Bransby Cooper before my first operation illustrative of this point. I was anxiously asking some questions relative to the operation, which he answered in his usual good-natured way, and his concluding words were these: "The incision your knife makes in entering the bladder will admit your finger, wherever your finger will pass your forceps will follow, and by the opening they make you can extract almost any stone." And I found these axioms practically correct, with rare exceptions, but then it was necessary to be patient where the stone exceeded a moderate size. In lithotomy, as in all operations consisting of several and independent steps, it is important to keep the mind fixed on each stage of the operation, without allowing it to be distracted by that which is to succeed. This may seem a very trite saying, yet I think it is not always attended to; cautious and deliberate action is far safer, though more time may be required; and this remark is applicable to the earlier steps of lithotomy as much as to the final one of withdrawing the stone. I adopted the use of a button-pointed scalpel, because I had known of more than one instance in which the bladder had been wounded by a sharp-pointed

knife: the exchange of knives necessarily protracted the operation, but I gained in security. When I first operated I used the same scalpel throughout. (Mr. F. Le Gros Clark, St. Thomas's Hospital Reports, 1883, p. 16.)

PROSTATIC GOUT.—Like gout acutely affecting the great toe, the attack usually comes on at night, the patient experiencing severe pain, which he refers to the perineum, and not unfrequently likens to a hot cork. Though painful, the desire to micturate is irresistible, and is accompanied with spasms, which often render any attempt to retain urine, even while the patient is getting out of bed, almost impossible. Sympathetic pain is at the same time experienced in the groin, or in one or both testicles, rendering the latter extremely sensitive to the touch. Exploration of the rectum with the finger—a necessary examination, which is sometimes so painful as to call for an anæsthetic—shows the prostate to be both tense and tender. During the day the symptoms generally abate, to recur at night. Like the analogous manifestation in the great toe, these acute prostatic attacks are not usually of long duration, as they merge into a chronic form, which will presently be noticed. The urine is loaded with lithates, and is invariably of an acid and irritating character. After an acute attack the prostate is often left excessively sensitive, and this is a point worthy of special consideration. After an acute attack of gout in the foot the limb is tender, and the person is more or less lame. So with the prostate: it remains sensitive and the patient dreads to call forth sufficient muscular force to completely empty his bladder. In fact, he lets the urine dribble off voluntarily, and retains a portion of it, so as to form a sort of water-bed behind his prostate. In this way he wards off from his sensitive gland the last and most painful efforts of each act of micturition. Watch a patient, with a prostate tender from gout, pass water, and the manner in which he cautiously eases off the pressure as the act is about to close is very significant. I have satisfied myself on several occasions that a degree of retention was thus caused by passing a rubber catheter and removing an ounce or so of urine, when it was believed by the patient that he had emptied his bladder. In the treatment of acute prostatic gout there are one or two points to which prominence is to be given. In the first place it is always associated with a highly acid condition of the urine, and with an excess of urates as well as of uric acid. The administration of alkalies under these circumstances can hardly be regarded other than as a natural expedient. There is this important difference between the residual urine of a sacculated bladder in connexion with a large prostate and that dependent

on a gland which is sensitive and merely temporarily enlarged: the former is benefited by catheterism, the latter is aggravated by it. (Mr. Reginald Harrison, p. 218.)

PUS IN THE URINE.—*New Test for.*—A few drops of hydrogen peroxide brought into contact with pus will produce an effervescence similar to that caused by hydrochloric acid on a carbonate. The action continues until all the pus is destroyed, so that it cannot be recognised microscopically. It affords the simplest and most delicate test for pus in the urine, the smallest quantity being easily detected. (Medical Times.)

STONE IN THE BLADDER.—*Detection by the Lithophone.*—Vibrations produced in a sound by its contact with a calculus are readily conveyed to the ear by means of an indiarubber tube, one end of which is attached to the handle of the sound, while the other is held to the ear, the ordinary bladder-sound being converted by this means into a kind of stethoscope. Direct experiment on the dead subject proves that the larger the bore of the tubing employed the better are the results. The largest bore of tubing thus used was 3-8ths of an inch in diameter, which gave the greatest intensity. But the weight of a tube of that size was an obstacle to the delicacy of touch. This difficulty has been overcome, however, by attaching smaller and lighter tubing in the manner described, which gives equal intensity, but without the drawbacks of the larger and heavier tubing. (Mr. J. McKenzie Davidson, M.B., p. 311.)

TUMOURS IN THE BLADDER.—Exploration of the bladder is warranted in all cases in which there is hematuria presumed to arise from the bladder, accompanied by pain and increased frequency of micturition, where no rational diagnosis can be formed by the more ordinary methods of examination. In such cases there is a reasonable probability that some new growth may be discovered. It is also called for in cases, equally inexplicable, in which hematuria is the only symptom. The beneficial result of opening the urethra under these circumstances is most strikingly shown in a case in which there had been persistent and considerable hemorrhage for three months before operation. Mr. F. Heath opened the membranous urethra and passed the finger through the prostatic portion, but it was found impossible to reach the bladder, owing to the stoutness of the patient and enlargement of the prostate; an indiarubber tube was passed into the bladder, and the urine allowed to drain away continuously. There was a slight trace of blood in the urine on the day following, but after that the hemorrhage completely ceased. In this case the two conditions produced by the operation were: (1) some dilatation of the prostatic portion of the urethra; (2) a

thoroughly empty and contracted state of the bladder. In this particular case there was some enlargement of the prostate, but it was not tender on pressure, and did not interfere with the emptying of the bladder. It seems most probable that the cause of the hemorrhage was a varicose state of the vessels at the neck of the bladder, and that the success of the treatment was owing to the subsequent constant contraction of the bladder, the result of the operation.—There are cases in which pain connected with the bladder, and altogether unaffected by medical treatment, is the only symptom complained of. In one case there was no pain at the end of the penis on passing water, but there was no stone or new growth in the bladder. As this symptom did not yield to medical treatment, the bladder was explored, but nothing was found; the patient had an attack of cystitis, from which he recovered. Three months after the operation the pain had disappeared and the patient had gained 14lb. in weight.—There can be little doubt that median perineal urethrotomy is by far the least serious of the operations which have been performed for removal of tumours from the male bladder, and in fact may be looked upon as quite safe if the parts at the neck of the bladder be not torn in the manipulations required for the removal of the growths. It is very difficult to formulate a short and expressive term for the operation; it is not a cystotomy, because the bladder is not, or should not be, *cut* into. Strictly it is simply perineal urethrotomy, but undertaken with a different purpose from that usually associated with the term. It is a median perineal urethrotomy followed by some dilatation of the prostate with the forefinger.—The operation is performed as follows: A grooved staff is passed along the urethra into the bladder, with the patient in the lithotomy position. The left forefinger is now placed in the rectum in contact with the apex of the prostate; by this means the rectum is protected and a guide for the direction of the incision obtained; the knife held in the right hand, with the cutting edge upwards, is now passed into the perineum exactly in the median line till its point lies in the groove of the staff just in front of the apex of the prostate; an opening into the urethra of just sufficient size to admit the tip of the forefinger is now made, and the external incision enlarged as the knife is withdrawn. A probe catheter is next passed along the groove in the staff into the bladder and the staff withdrawn; the forefinger well anointed with carbolic oil, or vaseline, is then insinuated into the urethra along the probe, and gradually pushed and rotated through the prostate into the bladder. With first the right and then the left forefinger in the bladder, whilst forcible

suprapubic pressure is made with the other hand or by an assistant, the best possible examination of the interior of the bladder is effected. In cases complicated with stricture of the urethra this plan has to be modified. Instead of the staff, which it may be impossible to pass, a fine straight probe must be substituted and constitute the sole guide for the perineal incision. After the point of the probe has been cut down upon, it is thrust out of the wound and another director is passed backwards through the perineal opening into the bladder, and the operation completed in the usual way.—Pedunculated tumours may be removed by the forceps or écraseur, but in some cases in which this has been done it has been found necessary to use either the finger nail or a sharp spoon, to scoop out the base of the growth. In broadly pedunculated or sessile growths removal by this means is impracticable, and in these cases the growth may be fearlessly, so far as hemorrhage is concerned, torn away or removed piecemeal by the finger and forceps, or sharp spoon, for any bleeding that might be feared under such circumstances is easily controlled by the injection of undiluted solution of perchloride of iron into the bladder. This treatment has now been frequently employed with the best results as regards the hemorrhage, and has not caused any untoward results; another proof of the power the bladder possesses of tolerating strong irritants.—After the operation we are in the habit of retaining in the bladder a soft elastic tube, through which it can be thoroughly washed, and through which the urine can be continuously drained away into a vessel placed beneath the bed; this tube has generally been very easily borne and retained. In females the examination is more easily accomplished by rapidly dilating the urethra by the successive introduction of œsophageal bougies, of consecutive sizes constructed with tapering extremities, until the apex of the forefinger can be insinuated and gradually passed along into the bladder. It is interesting to note that in the only case of tumour removed in this way in which subsequent incontinence was met with, it is mentioned that the urethra was slowly dilated by a sponge tent. (Mr. Walter Whitehead and Dr. Bilton Pollard, p. 322.)

TESTS FOR ALBUMEN IN THE URINE.—*Picric Acid Test.*—Dr. Geo. Johnson describes three several ways of using this test.—*First Method*: Into a test-tube six inches long the urine is poured to within two inches of the top, then the tube being held in a slanting position, about an inch of the picric acid solution is gently poured on the surface of the urine, when, in consequence of its low specific gravity (1003), it only partly mixes with the upper layer of the urine, and, as fa

as the yellow colour of the picric acid extends, there will be more or less turbidity from coagulated albumen, contrasting with the pellucid unstained urine below. This method is an imitation of Heller's method of testing with nitric acid.—*Second Method:* With the solid picric acid either in powder or in crystals. "As much as is equal in bulk to a peppercorn may be shaken up in a test-tube with a column of urine about an inch in height. As the powder dissolves the urine becomes turbid with coagulated albumen. The object is to add as much of the test as the urine will dissolve." The application of heat quickens coagulation.—*Third Method:* To add fifteen or twenty minims of water to the peppercorn bulk of acid in the tube, quicken the solution by the application of heat; an equal bulk of urine is then gradually added to the hot solution, when albumen, if present, is at once detected.—In using the picric test the urine must be acid, or previously rendered so by the addition of acetic acid.—In bringing forward picric acid as a test for albumen, Dr. Johnson claims that it is more delicate and therefore more trustworthy than nitric acid, whether the latter be employed by the method of dropping the acid into the cold urine, or by pouring the urine on the acid previously placed in the tube; and he says that, comparing the two, he diluted a specimen of albuminous urine until one or other of the tests failed, and the result was that "picric acid solution shows the presence of albumen in a specimen *diluted considerably beyond the point at which the nitric acid fails to give any indication;*" and further, "that picric acid often causes an immediate albuminous opalescence in specimens in which nitric acid only slowly, and after an interval of some minutes, gives a similar but sometimes doubtful reaction. (Dr. Vincent Harris, p. 222.)

Sodium Tungstate Test.—Dr. Oliver has done good service in bringing to light this test for albumen. In his hands it has proved to be a most valuable reagent. He recommends that it should be used as a test solution, prepared according to the following formula:—Saturated solutions of sodium tungstate (1 in 4) and citric acid (10 in 6), equal parts. It may be used either dropped into the urine or after the manner of Heller's test; and in the author's hands "always quickly revealed the same minimal proportions of albumen as could only be brought to light by picric acid and by the other tests of equal keenness." I look upon this test as even more satisfactory for minimal amounts of albumen than for maximal. The advantage of sodium tungstate is that it forms a perfectly colourless solution; is not apt to decompose, and is very cheap. I have tried this reagent in the "compound papers"

form of Dr. Oliver, and in solutions with citric acid and with acetic acid, and have been highly satisfied with the result. In nearly every case the solution was equal in delicacy to any other reagent. I have experimented with weaker solutions, both 5 per cent. and 1 per cent., and am inclined to believe that the former is the best strength, as in excess of the reagent the albumen precipitant is redissolved. (Dr. Vincent Harris, p. 224.)

Picric Acid as a Urinary Test when the Patient is taking Quinine. —Some time ago Dr. Johnson advocated the use of picric acid as a test for albumen in the urine; and his letter elicited an extensive correspondence. It was stated that picric acid was a much more delicate test than either heat or cold nitric acid, and would disclose the presence of albumen where these entirely failed. The requisite conditions are very simple:— An acid reaction and an absence of turbidity, both easily procured by a drop of acetic acid and a piece of filtering paper, if not present already. The suspected urine having been poured into a test tube to the height of three or four inches, an inch or so of a saturated watery solution of picric acid is gently floated on its surface; the appearance at once of an opalescent ring at the line of contact of the fluids shows the presence of albumen. One point was mentioned as apt to occasion error; when the urine contains an excess of urates, even though no albumen is present, a reaction occurs, but not till after some minutes, and on close examination it may be seen to be made up of small crystals which disappear on the application of heat, whilst the albumen reaction is granular and is rather increased by heat.—An accident has brought under my notice another fact to which attention has, I think, not yet been drawn. I had carefully tested for albumen a urine which was clear, pale, acid, and of specific gravity 1006, with negative results (heat and cold nitric acid being used), and was somewhat astonished to find that picric acid at once produced a most copious opalescence exactly resembling that produced by albumen, and showing no crystals under the microscope. A few days later a second sample, of specific gravity 1008 and acid, yielded similar results; and recollecting that the patient was taking five grains of quinine four times a day, I applied the picric acid test to a dilute solution of that drug, which I found behaved exactly as the urine had done. To corroborate the observation two male patients with healthy genito-urinary organs were placed on three-grain doses of quinine every four hours for two days, and their urine then tested. In each instance no trace of albumen could be detected (the specific gravity being 1010 and 1015 respectively), but picric acid at once produced a

copious opalescent ring. In each instance the application of heat cleared up the opalescence. Quinine is said to be almost entirely eliminated through the kidneys; and the reaction above mentioned I take to be due to the presence of this alkaloid. Whatever value may be attached to the picric acid test for albumen, and I believe it to be a very sensitive one, it will be well to recollect this reaction which occurs when patients are taking full doses of quinine; and it may also be an advantage occasionally to be able to demonstrate by this means at the bedside that a patient has recently taken this drug. (Mr. J. Frank Nicholson, Hull, Lancet, Dec. 10, p. 835.)

Dr. George Johnson, in referring to Mr. F. Nicholson's communication (above given) says, "It is a well-known fact that picric acid precipitates from solution, not only quinine, but all the vegetable alkaloids, such as morphia, atropine, &c.; the precipitate in every case, however, being readily and completely soluble by heat, and thus contrasting with an albuminous precipitate. The precipitate which picric acid gives with the vegetable alkaloids is also dissolved by a few drops of nitric acid; while to dissolve an albuminous precipitate a large excess of nitric acid is required. So far as we at present know albumen is the only substance commonly present in the urine which gives with picric acid a precipitate *insoluble when heated.* When I find that a sample of urine gives a precipitate with picric acid, I invariably warm the specimen. In about 99 per cent. the precipitate is made more dense by heat, and is unquestionably albuminous. In perhaps 1 per cent. the turbidity which occurs *immediately after the addition of the test* is due to urates, which under the microscope appear partly granular and partly crystalline, and which are redissolved by heat. I have not hitherto tested the urine of a patient taking quinine and eliminating it in sufficient quantity to give a precipitate with picric acid. The urine of those who are taking the ordinary medicinal dose of a grain two or three times a day is not rendered opalescent by the acid."

Dr. Oliver, of Harrogate, writes: "Of the albumen tests recently discussed in your columns picric acid is not the only one which will unfortunately precipitate alkaloids in the urine. For this property belongs also to the potassio-mercuric iodide test, as pointed out by M. Tauret of Paris in 1877, and just now conclusively confirmed by my own clinical observation. Both the picric and the mercuric precipitates of the alkaloids clear up with heat, or after the addition of alcohol. But even in the cold the opacity induced by the mercuric test can be easily distinguished from the albuminous one by its retaining for some time—e.g., more than a quarter

of an hour—a uniform turbidity, while the latter breaks up into flocculi much within a minute. The tungstate and the ferrocyanic tests do not precipitate alkaloids in the urine."

Dr. Robert Kirk, of Partick, Glasgow, writes: "Potassio-mercuric iodide also precipitates a very dilute solution of quinine. This, indeed, was only what might have been expected when one came to think of it, for the analogous compound—the potassio-bismuthic iodide — has already been proposed as a precipitant of the alkaloids. I found that both picric acid and potassio-mercuric iodide precipitated solutions of morphia, pilocarpine, atropine, and strychnia. All the precipitates disappeared with heat except that of liquor strychniæ and potassio-mercuric iodide. Aconitia was precipitated by potassio-mercuric iodide, but not by picric acid. (Lancet, Nov. 17, p. 879.)

TESTS FOR SUGAR IN THE URINE.—*Moore's Test.*—I pour about a drachm of saccharine urine into a test-tube, and add half its bulk of liquor potassæ, and heat it over the lamp; and after boiling it for a minute or two, you see it gradually assume a brandy-brown colour. This test is easily applied, but it is not very delicate, since it will not indicate a proportion of sugar less than about two grains to the ounce. Then Moore's test has sometimes misled inexperienced observers in this way:—Liquor potassæ often contains lead from the bottles in which it has been kept, and when lead-contaminated liquor potassæ is boiled with albuminous urine, the sulphur of the albumen combines with the lead to form a dark sulphide, which unpractised observers might mistake for the brown colour produced in saccharine urine. (p. 226).

The Fermentation Test.—When saccharine urine is mixed with yeast and kept warm, fermentation takes place with the evolution of carbonic acid and the formation of alcohol. Dr. Wm. Roberts has shown that this test may be made use of for a quantitative analysis. As the sugar is decomposed, the specific gravity of the urine falls. Each degree of specific gravity lost indicates one grain of sugar to the ounce. The great objection to this method is the length of time, at least twenty-four hours, required for its completion. The urine is capable of absorbing about its own bulk of carbonic acid, and, according to Dr. Roberts, urine containing two and a half grains to the ounce or less, gives no visible sign of fermentation. It is therefore less sensitive than even Moore's test. (p. 226).

Trommer's Test.—To this saccharine urine in a test-tube I add a drop or two of a solution of sulphate of copper, and to this an excess of liquor potassæ. The oxide of copper, which is first thrown down, is redissolved, and forms a clear blue

liquid. Now, on applying heat the oxide of copper is reduced to a sub-oxide, which forms a dense red or yellow deposit. An excess of copper, not being dissolved, may cause confusion, and the dark brown colour, from the action of the potash on the sugar, may interfere with the result. (p. 227).

Fehling's Solution.—A more satisfactory mode of applying the copper-test is in the form of Fehling's solution, which contains the following ingredients:—Sulphate of copper, 90½ grains, neutral tartrate of potash, 364 grains, solution of caustic soda, specific gravity 1·12, four fluid ounces, cold water to make up six fluid ounces. To use this solution, a column of about three quarters of an inch is poured into a test-tube, and heated until it boils, and then a drop or two of the urine to be tested is added. In a few seconds, if the urine contain much sugar, the liquid becomes of an opaque yellow colour, and a copious red or yellow precipitate falls. If the quantity of sugar be small, the urine is added more freely, but not beyond the volume of the copper solution. Fehling's solution soon undergoes change by keeping, a portion of the oxide of copper becomes precipitated, and then, of course, the strength of the test is changed. When the test has been kept for some time it will deposit sub-oxide on boiling without the presence of sugar. This is one reason for boiling the test before adding the suspected urine. If boiling the liquid render the test turbid, it must be filtered, or a fresh solution prepared. When the solution is used for a quantitative analysis, it must be freshly prepared, and its strength is such that 100 minims are decomposed by half a grain of sugar, the decomposition being shown by the decoloration of the liquid, and the precipitation of the sub-oxide of copper. When the urine is highly saccharine, it must be diluted to a definite proportion, five, ten, or more times, before the analysis is made, and then the result is to be multiplied by the number of dilutions. (p. 227).

Indigo-Carmine Paper Test.—Dr. Oliver has recently had papers prepared by drying after immersion in a solution of indigo-carmine with carbonate of soda. These papers form a delicate qualitative test for sugar. A paper is placed in a test-tube and covered with distilled water; heat is then applied until a blue solution is formed. A drop of diabetic urine is then added, and the heating continued. The solution changes from blue to violet, purple, red, yellow, and finally straw colour. After cooling and exposure to the air, the liquid passes back through the various colours into the original blue. The delicacy of the test is increased by using a car-

bonate of soda paper with the indigo-carmine paper. This paper-test, delicate and easy of application as it is, is not more so than the picric acid and potash test, and, so far as we at present know, it affords but an imperfect indication of the amount of sugar. (p. 234).

The Picric Acid and Potash Test for Sugar.—In 1882, I stated that I had accidentally stumbled upon the fact that picric acid, when boiled with caustic potash, forms a most delicate test for glucose. I added some picric acid solution to a boiling specimen of diabetic urine, which had been previously mixed with liquor potassæ, and found, to my surprise, that the liquid at once assumed an intensely dark colour. (I was not then aware of the fact that the reaction of picric acid with grape-sugar had been observed by Braun nearly twenty years ago.) In this paper, it is shown that grape-sugar, when boiled with picric acid and potash, reduces the yellow picric acid to the deep red picramic acid, the depth of colour depending on the amount of sugar present. I am not aware that hitherto any attempt has been made to utilise this as a qualitative clinical test for sugar in the urine, or as a means of accurately estimating the amount of sugar in a saccharine solution. I think, however, that, after having been the subject of much hostile criticism, the value of the test for both purposes has been completely proved and established.—I take a fluid drachm of a solution of grape sugar, in the proportion of a grain to the fluid ounce, mix it with half a drachm of liquor potassæ (*P.B.*), and forty minims of a saturated solution of picric acid, and make up the mixture to four drachms with distilled water. The mixture is conveniently made in a boiling tube, ten inches long and three-fourths of an inch in diameter, which should be marked at the height of four drachms. With a long boiling tube, there is little risk of the liquid boiling over; and the steam, condensing in the upper cooler part of the tube, flows back as liquid, so that there is little loss by evaporation. The liquid is now raised to the boiling point, and kept boiling for sixty seconds, so as to ensure complete reaction between the sugar and the picric acid. During the process of boiling, the pale yellow colour of the liquid is changed to a beautiful claret-red. The liquid having been cooled by cautiously immersing the tube in cold water, we ascertain that its level is that of the four-drachm mark on the tube; and if found below the mark, it is brought up to it by the addition of distilled water. The colour now is that which results from the decomposition of picric acid by a grain of sugar to the ounce four times diluted; in other words, it indicates one quarter of a grain of sugar to the ounce, and this colour is a convenient standard

for comparison in making a quantitative analysis. The picramic acid solution, however, on exposure to the light even for a few hours, becomes paler; but the colour may be exactly imitated by a solution of ferric acetate with an excess of ferric perchloride, and a slight excess of acetic acid.—Formula for the standard solution: Liq. ferri perchlor. fort. (sp. gr. 1·338), ʒ j; liq. ammon. acet. (sp. gr. 1·017), ʒ iv; acid. acet. glacial (sp. gr. 1·065), ʒ iv; liquor ammoniæ (sp. gr. 0·959), ʒ j; aq. destil. ad ℥iv. Mix thoroughly the iron solution with the liq. ammon. acet. and the acetic acid, then add the liq. ammoniæ, and dilute up to four ounces. The ingredients are all of the strength prescribed by the Brit. Pharm. (This standard solution may be obtained from Messrs. Bell & Co., 225, Oxford St., or Savory & Moore, 143, New Bond St.) The colour of this is equal to a quarter of a grain of grape-sugar to the ounce. When a fresh solution is made, it should be checked by comparison with a grain solution of sugar, boiled with picric acid and potash, and four times diluted. (Dr. George Johnson, p. 228.)

Since using the picric acid and potash test, I have so often found an excess of sugar in urine, when, from the comparatively low specific gravity, I should not have suspected it, that I now *invariably test for both sugar and albumen in every specimen of urine.* This double qualitative testing, which occupies less than two minutes, is done as follows. To about a drachm of urine in a test-tube is added an equal volume of a saturated solution of picric acid. If albumen be present, the liquid is rendered more or less turbid, and this turbidity is increased by boiling. Then half a drachm of liquor potassæ is added to the boiling mixture, the albumen, if present, is redissolved, and the boiling is continued for about thirty seconds. If sugar be present in the proportion of a grain to the ounce, the liquid will become darker than the quarter-grain standard, and two grains or more to the ounce will make the mixture black. (p. 233).

Bedside Testing.—For bedside sugar-testing, I carry in my pocket-case, in addition to powdered picric acid, grain-lumps of caustic potash, and a test-tube which is graduated up to 3 drachms. I put into the test-tube about a third of a grain of picric acid, as much as can be carried on the point of a penknife; then with the nipple pipette, or without it, half a drachm of water. The acid is dissolved in the water by the heat of a lamp or candle; now half a drachm of urine is added, and the presence or absence of albumen is ascertained; next a grain-lump of caustic-potash is added, and the liquid is boiled for a few seconds. In normal urine the resulting colour will be somewhat darker than the ¼-grain

standard until dilution with water is carried up to the twelve minim mark above the drachm, indicating 0·6 grain per ounce. If the colour be still darker, more water is added. If dilution to two drachms gives the $\frac{1}{4}$-grain standard colour there is one grain to the ounce, the urine having been diluted from $\frac{1}{4}$-drachm to 2 drachms; dilution to the 3-drachm mark would indicate $1\frac{1}{4}$ grain per ounce. If the colour is still darker than the standard the urine must be diluted before it is tested. This may be done by means of the nipple pipette which is graduated from 5 minims up to 30 minims. Thus 5 or 10 minims of urine may be diluted up to 10 or 20 or more times the volume with water. The diluted liquid is then tested in the small graduated tube, and the result multiplied by the number of dilutions. If after boiling a ten times diluted urine, as directed, with picric acid and potash, the standard colour is reached by dilution to the 1-drachm mark, there will be 5 grains of sugar per ounce. If dilution up to 2 drachms is required, the amount will be 10 grains; to the 3-drachm mark 15 grains, and for the intermediate dilutions the amount may be estimated with a near approach to accuracy. (Dr. George Johnson, p. 233).

WASHING-OUT THE URINARY BLADDER.—There are few things so conducive to the patient's comfort, when properly performed, as washing out the urinary bladder. But to be efficient it requires much care and gentleness in management, and most of the methods at present in vogue are open to the twofold objection of awkwardness of execution and risk of introduction of air. The following plan, which I have adopted, is simple and handy, and is, I think, free from these objections. The only really new feature in the apparatus is a vulcanite two-way tap, which Messrs. Arnold and Sons have kindly made for me. This tap I attach to an ordinary syphon enema; one nozzle is for insertion into the catheter; with the other, or waste tap, a piece of india-rubber tubing is connected to conduct away the effluent from the bladder. The catheter employed should be, where preference is possible, a large indiarubber one, but the nozzle of the tap is tapered so as to fit several sizes. In order to use the apparatus any residual urine is first evacuated by the catheter; the latter then remains full of urine. The enema and tap are previously immersed in the fluid to be injected, which is worked through the enema (the waste tap being turned off) a few times to expel all air, and the tap turned off while below the surface. The whole is then entirely free from air, the nozzle is pushed into the catheter, the stopcock turned on, and the ball of the enema slowly and gently

squeezed empty of its contents; by this means from one ounce and a half to two ounces have been injected; the afferent tap is then turned off, the waste opened, and the process repeated as often as necessary. The tap is made of vulcanite, which is superior to brass, as it is much lighter, and so does not tend to drag the catheter out by its weight. I have employed this method of irrigation in a great many cases in both sexes, and am fully satisfied with its convenience and efficacy. Water at the temperature of the body, to which a few drops of Condy's fluid have been added, I have found the most efficient and least irritating of all injections that have been recommended, superior even to carbolic acid and to quinine, the use of which is apt to be followed by some vesical tenesmus and discomfort. As regards the quantity to be injected, distension of the bladder is of course unnecessary and harmful; the habitually slow distillation of urine should be remembered; at the same time it would appear that the condition of an empty bladder is one not of tonic contraction, but of passive collapse, I think, bearing these facts in mind, that the gradual and cautious injection of about two ounces of fluid at a time is a safe and practicable mean. (Dr. W. J. Collins, Lancet, Feb. 2, p. 201.)

Washing-out the Urinary Bladder in Cystitis. — Washing out the bladder in cases of cystitis, from whatever cause, is followed with so much comfort that it has always surprised me it is not more frequently or systematically done. I pointed this out some years ago in my lectures on the diseases of the female bladder, and I then recommended various medicaments to inject. Especially is relief obtained in cases of ammoniacal urine; and I have always found the injection of an acidulated warm water the most beneficial; about one drachm of dilute nitric acid, or hydrochloric acid, to half a pint or one pint of water is a good proportion. Even vinegar and water answers well, and I always prefer to leave a little behind when the bladder has been well irrigated. This forms a little stock in hand for an hour or so, and I have generally found it well tolerated. But I do not propose to enlarge on the topical treatment. The purpose of this communication is to point out a way I have adopted many years, and taught, at Guy's, whereby is caused the least annoyance possible in washing out the bladder. I employ an open-ended catheter, or "cannula," the technical name, I believe; with this I draw off the urine, passing it no further than absolutely necessary. I mark the point on the catheter if possible. When the bladder is empty I withdraw it half an inch—

that is, outside the sphincter. When I inject I leave it still outside. There is no difficulty, the fluid passes easily through the sphincter; after it has remained two or three minutes within, the catheter is passed gently back the half inch or so and the fluid just injected escapes. This can be repeated as often as desirable. If it is intended to leave any injection in the bladder, it can be done in the same manner without the entry of the catheter. By this means the bladder is spared any irritation or damage, and, although the plan recommended by Dr. Collins is very excellent, I have found a two-ounce syringe, with a very tapering nozzle, answer very well. It will easily fit any catheter, and can readily be removed from it. (Dr. Braxton Hicks, Lancet, Feb. 16, p. 312.)

Vesical Injections in Chronic Cystitis.—I can fully endorse the remarks of Dr. Collins on the value of vesical injections in chronic cystitis, having employed them in many cases of cystitis following stricture or enlarged prostate. The agent I have found most efficacious in allaying pain, lessening fetor of urine, and muco-purulent discharge, is a warm 1 per cent. solution of carbolic acid. The method of injection employed is older and simpler than that suggested by Dr. Collins, the only addition to the catheter being about a yard of rubber tubing and a funnel. With ordinary care this simple apparatus will fulfil the great requirement of any instrument for vesical injection—viz., the complete exclusion of air from the bladder. The method of procedure is as follows:—1. The patient being in bed, the catheter is passed with tube and funnel attached, and the urine is run off into a bowl on the floor. 2. When the urine ceases to flow over the brim of the funnel, the latter is slowly raised till it is above the level of the patient, the carbolic solution being poured in. 3. The level of the fluid in the funnel is never allowed to sink below the apex, for in pouring the fluid into the empty tube it would be difficult to avoid the entrance of air. 4. When the patient feels a sensation of desiring to pass water, the funnel is lowered and the tube reconverted into a syphon. This is repeated till the solution is returned clear and colourless. This method is free from any danger of over-distending the bladder (which might be urged against the use of any injection syringe), since the only force used is the weight of the column of water in the tube and funnel. I have only had the opportunity of trying this treatment in one case of acute uncomplicated cystitis. Here, however, the pain and tenesmus entirely disappeared after the first injection, and the character of the urine at once improved. In a few days the patient was quite well. (Mr. J. W. Batterham, M.B., Lancet, Feb. 9, p. 282.)

AMPUTATIONS, FRACTURES, DISLOCATIONS, AND DISEASES OF BONES, JOINTS, ETC.

ANTISEPTIC TREATMENT.—As regards antiseptic treatment, I should just like to make this remark: that nowadays it is not a very complicated business, either in theory or in practice. First, as to theory. We do not require any scientific theory in order to believe in antiseptic treatment. You need not believe in the germ theory at all; if you are not convinced of the truth of the germ theory of putrefaction and of septic agencies generally, no matter whatsoever, with reference to antiseptic practice, all you have to believe is that there are such things as putrefaction and other septic agencies, that our wounds are liable to these, that they are very pernicious, that these things come from without, and that we have the means of preventing them by various chemical agencies. That is all that we require, and I think anybody who knows the present state of surgical practice must admit these to be truisms. It has sometimes been a great grief to me to think that because gentlemen are not convinced of the truth of the germ theory out-and-out, therefore they lay aside antiseptic treatment altogether. And then as to practice. It is not a very difficult thing to wash your hands in a carbolic solution and have your instruments in this carbolic solution for a quarter of an hour before you operate. It is not a very difficult thing to wrap round the limb a suitable envelope of antiseptic material. What I believe to be one of the most important things of all is strictly to maintain this rule inviolate, which I insist upon with my dressers, and which I confess I have insisted upon more of late years than I used, and that is always when we change a dressing, invariably first to cover the wound with something pure;—not to wash the surrounding parts with antiseptic solution, and then, after this has been done, put a dressing on the wound, but before we begin to defile our lotion at all, put on the wound what is pure, and last thing of all wash the surrounding parts, which, though they look the same to our eyes, are different, *toto cœlo*. The edges of the dressing are septic—the wound, if it is as it ought to be, is aseptic. I have known such a thing, for instance, as for a gentleman in dressing a stump after amputation of the thigh to wash the perineum with a rag dipped in the carbolic lotion (1 in 40) and then, having washed the perineum, immediately to squeeze this rag over the wound. You laugh! but I assure you these are the kind of things that are constantly occurring; disasters happen in consequence; and then gentlemen with whom things go wrong invariably say that with them everything has been perfectly done—a thing which for my part I am always loth to say. (Sir Joseph Lister, p. 247.)

AFTER-MANAGEMENT OF OPERATIONS.—When the requirements for arresting hemorrhage, whether by ligature or torsion, have been attended to, has the time for closing a wound arrived? Scarcely yet, in my opinion. If a cut surface be carefully watched, the sanguineous oozing from numberless points will be seen to be gradually replaced by admixture of serum with the blood, until the former predominates. This is the natural step towards the sealing of the vessels by the deposit of a plastic film over the surface of the wound. And here, I think, the surgeon may afford valuable assistance in facilitating this process. For many years I have been in the habit of using, for this purpose, a mixture of equal parts of spirits of wine and water, with which I have freely sponged the surface: after this the wound may be carefully closed with sufficient sutures of silk, or still better of silver, to secure the accurate and perfect adaptation of its edges; and then I have felt it safe to leave the wound exposed, for its entire margin to be sealed, if I may so express it, by the plastic deposit hardening in the intervals between the sutures. I cannot but speak favourably of this mode of treatment, because I have experienced its value; though I am aware it will find favour with but few nowaday. At any rate, it is consistent with the most absolute cleanliness. If reaction brought with it an access of local heat, I used to place over the wound a rag with evaporating lotion. Thus much for healing by adhesion of opposed surfaces or edges. Where a gap has to be filled by granulation the requirements seem to be, as in germination, warmth and moisture; with these should be combined means for the absorption of the discharge, with security for scrupulous cleanliness by frequent change of dressing. Nothing so satisfactorily fulfils all these desiderata as simple water dressing. Either soft lint or cotton wool may be employed for this purpose; and warm irrigation of the surface is both soothing and cleansing.

Shock.—The reaction after shock *generally* bears a certain relation to the amount and duration of the latter. It is delayed where the shock is great and prolonged, anæsthetics notwithstanding; and such is naturally the case where the loss of blood had been considerable. And not only is this reaction, as manifested both locally and generally, to be looked for, but, if not excessive, it is to be welcomed as a measure of nature's activity in commencing the work of repair. On the morning after a serious operation I should always regard with anxiety the announcement that my patient had no complaint to make, and the absence of the usual indications of general febrile disturbance. I would far rather find him with a quickened pulse, a raised tem-

perature and heightened colour, signs of nature's resentment at the injury inflicted, and of her energetic resolve to repair the mischief. As I have remarked, I am speaking only generally: there are exceptional cases in which reaction is but slightly marked; and others in which its excess is alarming. (Mr. F. Le Gros Clark, St. Thomas's Hosp. Reports, 1883, p. 38.)

AMPUTATIONS.—*Primary and Secondary Amputation.*—Where amputation is imperatively demanded, *i.e.* where there is no question of saving a limb, it is only profound collapse that would induce me to delay an operation. I say profound collapse, because shock, more or less severe, is a necessary consequence of these injuries; and their complicated nature, moreover, generally involves the risk of recurrent hemorrhage when reaction comes on. There are no circumstances under which I dread to encounter Nature—if I may so express myself—so much as in striking a blow when she is making an effort to rally after a shock; for when she feels it she is apt to surrender in despair. It is more judicious to strike again before there has been time to rally; for it is remarkable how little the second shock is felt at this time; and if hemorrhage can be controlled, it adds little to the peril of the patient's condition. But these remarks do not touch the question of primary or secondary amputation, in their strict meaning; for the definition of the latter, as regards time, should be limited to that condition which supervenes after some effort at repair has been made; when, from whatever cause, it appears that the effort is failing, and that the life of the patient will probably be the penalty. Where amputation, sooner or later, is evidently the only remedy, I have no hesitation in preferring an early operation, and especially for the reasons I have just assigned in speaking of immediate amputation. But when the nature and extent of the injury, and the general condition and antecedents of the subject of it are such as to leave on my mind a reasonable doubt of the incurability of the lesion, I should be disposed to give the patient the benefit of that doubt: and this for the following reasons. The circumstances of the case would probably admit of the reparative power of the patient being tested until a sufficiently advanced stage of the case had arrived for the infliction of a second shock to be borne with comparative impunity; and the surgeon may then interpose beneficially, by relieving what I may term an avowedly fruitless effort: and I may observe that this is a condition in which Nature—to continue this figurative mode of expression—welcomes such interposition, and thankfully transfers her previously futile agency to the kindly healing of the fresh wound. Moreover, it is to be borne in mind that,

with this prospect in view, we give the patient a twofold chance; that of saving both life and limb; and, at worst, a reasonable hope of saving his life, by the sacrifice of his limb if that should become necessary. And it must be familiar to all surgeons that, in amputation under the circumstances referred to, the expectation of recovery is much better than in primary amputation; for I should place such cases as I am considering, in the same category with similar operations necessitated by wearing disease; which are, in the absence of organic or other impending mischief, far more successful than primary operations of importance needed for injury. Amputation of the thigh, for instance, undertaken for hopeless disease of the knee, generally succeeds, and recovery is often rapid: whereas the same operation for a crushed joint is too often fatal: such, at least, is my experience. And I am disposed to view many other operations in the same light. I have observed that where patients have suffered severely from stone in the bladder, provided that suffering is not due to organic mischief, they recover more satisfactorily after lithotomy than those who have suffered little, because the relief experienced is greater: and so with other operations. Indeed, each year's experience has added to my confidence in Nature's resources and my vigilant observation of her indications: and this, after all, constitutes, in my humble opinion, the great lesson of a long life spent in the observation of disease; and it should find its practical application in a watchful respect for all she is willing to disclose, and a compliant—I do not say servile—submission to her guidance. But this study must carry with it a capacity for the just interpretation of what we witness; which, also, experience alone can impart.—Amputation at the shoulder-joint is rarely demanded for injury: if only the tubercles and their attached muscles be left, it is wonderful how useful even this short but mobile stump becomes. I have only twice amputated at the hip-joint for disease, and both patients recovered from the operation. (Mr. F. Le Gros Clark, Ibid, p. 32.)

Flap Amputations.—Most surgeons have their special opinions on this subject, some preferring much and others but little or no muscle in the flaps of their amputations. After testing various methods I have, for a long time past, arrived at the conclusion that the skin-flap, in most cases, makes the more satisfactory stump, when fully healed. The only exceptions to this rule are those in which the entire limb is removed at the shoulder or hip-joints. In primary amputations for injury we must of course be guided by circumstances: yet these are rarely such as to necessitate a deviation from the rule. It is true that flaps, with plenty of muscle and

nicely adjusted, make a far more sightly stump at first: but it is rather of the stump healed than of the stump after its first dressing that we ought to think; and, as I have said, I have found the exclusion of muscle more generally successful in this respect. Reactionary hemorrhage is less likely to occur when the muscular arteries are cut through transversely than obliquely. The tension of the adjusted flaps is less where skin, of which there should be an ample sufficiency, is alone employed: and I think the risk of much suppuration is thereby limited. Moreover, it is somewhat difficult to forecast how the muscles, if composing part of the flap, will behave, as regards retraction. Certainly, in immediate operations for injury, if muscle be retained it must be cut shorter than where the operation is for the removal of disease. This seems paradoxical, but the explanation is simple. When touched by the knife the healthy muscle contracts vigorously; and if divided in this contracted state, its subsequently relaxed condition will manifest the correctness of the remark, by the inconvenient redundance of the flesh protruding even beyond the skin, especially in such long unattached muscles as the ham-string. Such is not the case in the attenuated muscles of a diseased limb, in which the retractile property of the skin is relatively less interfered with. Insufficient skin, in either form of operation, is a serious defect; but even a superfluity is no great fault, though certainly undesirable. I prefer two semilunar flaps (except in the upper arm) to the circular incision which was almost universally employed when I first entered the profession. The former method admits of more easy adjustment; and if there be suppuration the drainage is better. The most accurate adaptation should be secured with plenty of sutures; but not until sanguineous oozing has ceased. All fibrous structures, such as tendons and fascia, should be removed as far as can be from the flaps.—One word respecting Pirogoff's amputation. My experience of it is not encouraging: it is too uncertain to trust. When successful in the union between the opposed surfaces of the tibia and os calcis there is nothing to be said against it; but I would rather trust to Syme's amputation of the foot which rarely fails of being a complete success. (Mr. F. Le Gros Clark, Ibid, p. 34.)

Amputation by Oblique Circular Incision.—To take the middle of the thigh as an example, I place the heel of the knife at A (*see woodcut*, p. 264), draw it round the limb obliquely, upwards and backwards, at an angle of about 55° to its axis, to B, where the direction changes, as it passes round the posterior aspect, to a direction obliquely downwards and for-

wards back again to A. Both at A and B, the line of incision is slightly rounded, so that A is convex and B concave. This incision goes at once down to the muscular aponeurosis; although it is convenient, for the subsequent insertion of the stitches, to have the skin free from fat midway between the upper and lower limits of the incision, on both the outer and inner side of the limb, as the flap has here to be folded on itself. The skin and its attached fat is next dissected back for a couple of inches at A, and taken in hand by an assistant, who pulls it upwards, so as to enable the surgeon similarly to separate it to a less extent all round the limb. This being done, the knife is then sunk obliquely into the anterior muscular mass, as was done by Alanson, until it reaches the bone; and the whole being well retracted, the remaining mass of muscles is totally divided in the ordinary manner by two principal strokes of the knife, the direction of which is still slightly oblique towards B. The bone being cleared, it is sawn at C, which is about an inch or an inch and a half above B. As a result of this method of operating, the anterior portion of the soft parts falls well over the face of the stump and end of the bone, the convex anterior flap fitting nicely into the concave posterior, and, when healing is completed, the scar is entirely behind the bone, and in no danger of pressure. (Dr. James Hardie, p. 263.)

CARIES OF BONES.—This condition in bones, which holds the same relation to necrosis as ulceration in soft parts does to gangrene, should be studied in this light with a view to its surgical management. The process of destruction is essentially the same as in ulceration of soft tissues, and that of repair differs only in the nature of the texture reproduced. These remarks are trite enough, but their application is in the inquiry whether the treatment ought not to be consistent with this parallel? I think it should in every respect, both general and local. Where practicable, free vent should be given to the discharge, whether during the destructive or reparative stage; and the living tissue should be stimulated to activity in throwing off the dead, and in accomplishing repair. In some cases, where large joints are attacked, this treatment cannot always be applied; but I think that in many instances free incision into even important joints may be practised with much advantage and without risk: for a diseased synovial membrane may be placed in the same category of insusceptibility as a diseased serous membrane. There is one form of treatment of carious bone which is generally advocated, but which I have rarely employed, because it is at variance with the principles I have referred

to, and also, in my experience, is not productive of the good results ascribed to it; I mean gouging. It seems to me as rational to expect a healthy surface to succeed a similar proceeding in an indolent or spreading ulcer. Surely, wherever the gouge is applied, healthy cancellous tissue must be bruised and killed, and then an extension of the mischief must follow. It is in the tarsus that this rough handling most generally finds favour. I prefer a free external incision and dilatation of the bony sinus, removal of any dead fragments that may present themselves or may be loose in the cavity, and then the injection or constant application on lint of a solution which acts both as a stimulant and bone solvent.—It is a familiar fact that bone elements are found, in more or less abundance, in the discharge from a carious cavity. I assumed that phosphoric acid would be the best solvent of the inorganic constituents, but Dr. Bernays informed me that acetic acid is preferable. After some experiments I decided on using this, in the proportion of one part of the acid, known as Beaufoy's No. 11, to five of water. This I injected daily into the carious cavity, and applied also by introducing lint dipped in the solution, being careful, however, not to plug the opening. I venture to commend this practice to others. Gouging may appear to hasten these cases, but for the reasons I have assigned I do not believe such is really the case.—Whilst on this subject I may refer to a condition of cancellous texture, apparently the precursor of caries and abscess, where an opening into the bone affords immediate relief. When, for instance, the symptoms and sufferings of a patient may induce the surgeon to trephine the head of the tibia, in expectation of opening an abscess, he may find no pus: yet he need not regret his operation, for the suffering will probably be relieved, and the diseased action be cut short by the discharge accompanying the healing. (Mr. F. Le Gros Clark, St. Thomas's Hosp. Reports, 1883, p. 24.)

Dislocation of Semilunar Cartilage of Knee-Joint.— I would strongly urge that after thorough reduction of the displacement, passive movements be made by the surgeon frequently for a few weeks, the knee must not be fixed in an ordinary knee-cap; for free flexion and extension should be allowed, and an apparatus should be worn which prevents all other movements of the joint, and in some cases it is of advantage to adapt a pad to press upon the place where the cartilage has been felt to protrude. If all surgeons were to recognise these facts, and act upon them, we should hear less of the *successes* of the bone-setter. (Mr. Noble Smith, Lancet, Nov. 3, p. 795.)

EXCISION OF JOINTS.—This is a comparatively modern triumph of conservative surgery. Certainly very many limbs are now saved which would have been sacrificed when I began my hospital work: sacrificed often not so much from a conviction of the absolutely irremediable amount of disease, as on account of the utter inability of the patient to endure the strain and exhaustion accompanying the reparative effort. It would be a bold assertion to affirm that no such casualty has happened as the occasional excision of a joint, which might have been saved under the old system of absolute and persevering rest. Although I have operated in many instances, and especially in resection of the knee-joint, I have but one general remark to make; and that is, how very much importance I attach to the most scrupulous removal of every trace of diseased tissue. Too much time and care cannot be expended on this very material element of success. In speaking of this particular joint I may observe, that I have found the difficulty of keeping the osseous surfaces in exact relation is diminished by sawing through the condyles of the femur, in such a manner that the face of the section shall be convex, or rather present a very obtuse angle in the centre, fitting into a corresponding concave section or re-entrant angle of the tibia. This may generally be accomplished, and sometimes with advantage as regards the tibia, disease in which more often extends deeply than in the femur. (Mr. F. Le Gros Clark, St. Thomas's Hospital Reports, 1883, p. 40.)

EXCISION OF THE SHOULDER-JOINT.—The remarkable change for the better in the results now obtained is undoubtedly due to the abandonment of flap-methods of operating, to the adoption of the Ollier or Langenbeck-Ollier line of incision, to antisepticism, promoting thereby rapidity of union; and lastly, and perhaps as regards the ultimate result most important of all, to the early commencement of passive movements, exercises of the arm, and shampooing, which so materially aid in preventing the formation of fresh internal adhesions, and promoting restoration of muscular power. If the adoption of judiciously directed gymnastic exercises and shampooing be had recourse to at an early date after the operation, an all-important factor in the after-treatment of such cases, the good results above indicated, and which should be hoped for in all instances, can reasonably be expected, and that not only in early but in adult periods of life. The method of operating which in all cases I have adopted is a modification of the Ollier-Langenbeck periosteo-capsular method. The incision was in all instances commenced a few lines external to the tip of the coracoid process, and carried

downwards and slightly outwards, avoiding the cephalic vein, for a distance of about four inches, and a little external to the inner border of the deltoid muscle. By this, there is avoidance of the posterior circumflex artery and nerve, and there is the minimum amount of interference with the deltoid. The functions, therefore, of this muscle are by this procedure better preserved than by any other of the suggested operations; and there is great facility attending the division of the capsular muscles of the shoulder, notably the subscapularis. (Prof. Wm. Stokes, p. 256.)

EXPLORATORY OPERATIONS, &c.—An exploratory operation often clears up a doubt as to the nature of a disease. This may be accomplished with a grooved needle or small trochar: but I prefer a common lancet ground down to a fourth of its original breadth; just sufficient in fact to admit the introduction of a probe afterwards, if necessary. But not infrequently a free incision is required. For instance, it is not always possible to determine the nature of a mammary tumour; the resemblance in history as well as physical signs, between scirrhus and chronic abscess may render the diagnosis extremely obscure. This once occurred to myself, in a hospital patient, from whom I removed the breast, under the conviction that I was dealing with cancer: and others were deceived as well as myself. In this case no harm was done; for the induration surrounding the purulent cavity occupied part of the shrunken gland in an elderly woman; and she recovered more speedily than would have been the case under any other treatment. I have known similar obscurity to exist in other cases. Under these circumstances the best course is to make the first incision for removal of the breast, and to examine the tumour before proceeding further. The same remark applies to disease of joints: an exploratory incision may, where doubt exists, be made the first step towards resection or amputation, as the case may be. In removal of the breast the incisions are usually made with their concavities facing each other: I have found it preferable to make the upper incision with a convex edge directed towards the concave edge of the lower: the adaptation of the flaps, without puckering of the corners, is thus rendered more satisfactory. In large tumours, such as the fatty class, a single incision is generally all that is needed; skin should rarely be removed; for it is surprising how much the stretched integument gradually resumes its normal expansion, by its elastic contractility. This remark does not apply to the breast, where the excision of the gland requires a corresponding removal of skin. (Mr. F. Le Gros Clark, St. Thomas's Hospital Reports, 1883, p. 40.)

FRACTURE OF THE OLECRANON.—*Silver Wire Suture.*—I operated on a case of ununited fracture of the olecranon on July 28th, 1881, paring the broken surfaces as in my other cases (*see* p. 235), using a chisel and hammer for the purpose; and having drilled the fragments with a common bradawl, I brought them together with moderately stout silver wire. In this case, however, I did not leave the ends of the wire projecting from the wound; but having given them one complete twist (or two half twists), cut the ends off short and with a small hammer hammered the twisted part down flat upon the ulna. The advantage of this practice was strikingly exemplified by the difference in the course of this case from its predecessors. Instead of keeping him under treatment for several weeks until the wire could be removed, I was enabled to allow him to return fifteen days after the operation to his home in Wales with a sound cicatrix, and, trusting to the connecting loop of wire, permitted him to use the elbow freely. I afterwards learned that he was able to drive a four-in-hand as well as ever. The practice of cutting the ends of the wire short and hammering down the twist upon the bone is in every respect an advantage. The hammering down of the twist renders it more secure than if it is left projecting, to be moved by every shifting of the dressing, and perhaps broken, as in the second of the cases just referred to. We also get rid of a source of disturbance, and sometimes of considerable uneasiness, in the wound. The time of healing is greatly shortened; and the knowledge that the loop of wire securely holds the fragments in position allows the use of the joint to be commenced much earlier than when we have only the organic band of union to trust to. The practice is also of the highest value in ununited fracture of the shafts of the long bones. The thickness of the wire must be proportioned to the force to which it is to be subjected. For the olecranon, only about one twenty-fifth of an inch in diameter is amply sufficient. For the shaft of the femur of an adult male, a piece of wire, about one-tenth of an inch in thickness is requisite in order to resist with certainty the enormous force of the great muscles of the thigh. The pieces of bones which I hold in my hand were removed in August, 1881, from a case of badly united fracture of the femur. The patient was a gentleman from Rio de Janeiro. The fracture had occurred about the junction of the middle and upper thirds of the bone; it had been so badly united that the fragments overlapped very much, and also were at a considerable angle with each other, so that the limb was extremely distorted as well as much shortened. Bloodlessness of the operation having been provided for by elevation of the limb and the application of

an elastic tourniquet, I cut down from the outer aspect of the thigh upon the seat of fracture. Then with a periosteum detacher I separated the soft parts from the place of junction of the fragments, and in the next place I went through the extremely laborious process of cutting through the osseous union (which was of almost ivory hardness) parallel to the axes of the two overlapping fragments. This having been at length accomplished, and the soft parts still further detached, I found I was able not only to get the limb into a straight position, but also by a very moderate extension so to reduce the riding of the fragments that by sawing off comparatively small portions I was able to bring their extremities into apposition and apply my suture. This was done with wire of about this same thickness. The limb was put up at first with a long splint. Being a weakly man, it was some months before absolutely firm union was obtained. It would have been extremely embarrassing to have had the ends of the wire sticking out from the wound all that time. On the contrary, it was a very great comfort to have no occasion to think about the wire; and ultimately he left for South America with a perfectly straight limb, almost of the same length as the other, and with thoroughly firm union established. (Sir Joseph Lister, p. 237.)

FRACTURE OF THE PATELLA.—*Treatment by Wire Suture Antiseptically applied.* — In a case of transverse fracture of the patella, I applied a common bradawl in the middle line of the patella, drilling each fragment obliquely so as to bring out the drill upon the broken surface a little distance from the cartilage. Pretty stout silver wire was then passed through the drilled openings and the fragments brought accurately into apposition. Before they were brought together, however, an arrangement was made for the drainage of the joint. This was done in the following manner. A pair of dressing forceps with the blades closed were passed through the wound to the most dependent part of the joint at its outer aspect. The instrument was then forcibly thrust through the synovial membrane, the fibrous capsule and the fascia, until the point of the forceps was felt under the skin. An incision was next made with a knife through the skin upon the end of the dressing forceps so as to allow it to protrude. The blades of the forceps were then expanded so as to enlarge the opening which they had made in the deeper structures without risk of causing hemorrhage. The drain was then seized in the forceps that protruded through the wound and drawn into the joint. The ends of the wire were now twisted together and the twisted ends brought out at the wound, which was closed with sutures and a small drain in-

serted. The limb, enveloped in an antiseptic dressing, was placed in a trough of Gooch's splint, with the upper end oblique, corresponding to the line from the tuberosity of the ischium to the great trochanter, and the lower end excavated in the form of a horseshoe, while the horns of the horseshoe were well padded to support the sides of the foot. It is unnecessary for me to enter into details as to the progress of this case. The temperature chart indicates, you observe, after a little temporary disturbance immediately after the operation, an entirely afebrile condition. The wounds healed without any suppuration. At the end of eight weeks the wire was removed by an incision through the cicatrix. Eight days later the wound made for the removal of the wire had healed. At the end of ten weeks from the operation the patient was allowed to get up; and though no passive motion had been employed he could move the limb freely through an angle of about 30°. Two days later he was discharged, and, unfortunately, nothing has been heard of him since. This, I believe, is the first instance of a recent case of fracture of the patella being treated by wire suture antiseptically applied.—It is very desirable that the lower surface of the patella should be left quite smooth. We cannot be perfectly sure when we drill that the bradawl will come out exactly at a corresponding point on the two surfaces. Supposing that on one side the instrument should have come out too far down, it may be into the cartilage; we do not regard that at first, but pass the wire through the two drill-holes, and then on that side on which the hole has come too far down, by means of the bradawl we simply chip away a little of the material that is above the wire until the wire comes to be in a position exactly opposite to the hole on the other side, leaving a gap below, as indicated by the dark shade at *d* (See Fig. 2, p. 246). This is a perfectly simple matter; at the same time it might possibly not occur to anyone doing the operation. Here we have the wire represented twisted and the twist hammered down. The twist always goes to one side. (Sir Joseph Lister, p. 239.)

Fracture of the Patella.—Chief Cause of Want of Osseous Union and how to obviate it.—(1) The chief cause of non-osseous union of the patella in cases of transverse fractures is the interposition of fibrous and aponeurotic structures between the fractured surfaces. (2) If osseous union be desired in transverse fractures of the patella, it is requisite, in the first instance, to elevate all the tissues which lie over the fractured surfaces, and which prevent them from coming into intimate contact. (3) From the ease in which the two fragments, in

many instances, may be maintained in position, it is probable that osseous union could be obtained without suturing, provided these soft tissues were first elevated. Practically, however, suturing the patella ought to be adopted, as it is the easiest and surest way of securing accurate apposition and adds no risk to the operation. (4) The operation of elevating the soft structures between the fragments and of suturing the bone ought to be undertaken within the first forty-eight hours from the time of injury. (5) In order to lengthen a muscle, a series of V shaped incisions made into its substance in a transverse row will effect the purpose, while not diminishing its strength as transverse incisions do. (Dr. William Macewen, p. 251.)

Fracture of the Patella.—Cause of failure of Aseptic Method.—The main question is, of course, that of ensuring an aseptic wound. The ordinary precautions about instruments, hands, spray, dressings, &c., are now almost matters of automatic routine; but there is one important condition about which I wish to speak particularly, for I believe it to be a more prolific source of the so-called "failure of the aseptic method" than is any other individual factor. It is the condition of the tissues, especially the skin of the part operated upon. Within a very recent period I have known of antiseptic (?) operations (not operations of urgency) being performed where almost up to the very moment of incision the skin had been an entire stranger to any form of germicide whatever, and in the practice of this hospital it has been conclusively demonstrated that the method described by Mr. Cheyne is, at any rate amongst the lower classes of a large manufacturing town, in many cases insufficient, and always so in such regions as the axilla or about the toes, &c. Moreover, the application of 1 in 20 carbolic lotion to the skin for half an hour has in several cases produced such severe vesication as to necessitate the postponement of the operation. The plan adopted here in all operations except those of immediate urgency, is to rub the skin vigorously for a short time with spirit of turpentine, which appears to be the most effective solvent of the fatty and sebaceous accumulations about the hair-follicles and gland ducts. The part is then wrapped for twenty-four hours at least in lint soaked in a 2 per cent. solution of carbolic acid. This is renewed several times and the skin shampooed in the intervals so as to remove all the dead epithelium. In a series of more than 100 osteotomies for deformity performed during the last two years, the few cases of suppuration have been generally associated with the insufficiency of this precaution. In operations for injury, strangulated hernia, &c., dependence is placed almost entirely

upon the turpentine as a solvent and antiseptic. It is a striking fact that the proportion of suppurations in primary amputations as compared with those for disease (except for gangrene or other antecedent putrefactive conditions) is about two to one. It is also worthy of remark that these suppurations appear as a rule to be conditioned by and limited to a micrococcus infection, and do not develop the putrescent features of open septic wounds. The vertical incision is the simplest and best in recent cases, but when greater holding power is required, it is much more convenient to make it transversely. The great advantages of Malgaigne's hooks in procuring and, under certain circumstances, maintaining apposition was seen in the present case. In the first and second cases, in August and October, 1881, the wire twists were cut short, hammered down, and left *in situ*, and in both cases, when seen almost a year afterwards, the sutures had not caused any irritation whatever. (Mr. E. Ward, M.A.Cantab., p. 254.)

FRACTURES IN THE VICINITY OF JOINTS. — *Plaster-of-Paris Bandages.*—The skin must be protected by a flannel bandage, which is applied evenly and smoothly over the whole part. Should the skin be abraded, a simple ointment may be spread beneath the bandage, cottonwool may be used over any part or projecting fragment. Half-a-dozen bandages rolled in dry plaster are now prepared. The material is most important, it should be the coarsest muslin, so that the plaster and moisture may easily permeate the whole mass when adjusted. The bandages should not be more than two inches in width; a narrow bandage can be made to fit and insinuate itself into the inequalities of a part in a superior manner to a wide one. Some loose dry plaster in a basin, and plenty of warm water, are all the other things needful. The surgeon having applied the protecting flannel, proceeds to the "setting" of the fracture. In doing this he should use the greatest care and gentleness, and grudge no time or caution. It is often well to employ an anæsthetic; a more certain opinion can then be formed of the injury, while the released muscles allow the broken bones to move about freely, and they crepitate between the hands of the operator, who may place them in the most accurate position. Now comes the work of the assistant, and this though simple, is hardly second in importance to that of the principal operator. He has to hold the fracture in *exact position*, during the application of the apparatus. In some cases he may have to make extension as well, but he should ever recollect, that he must not let his attention flag, or his muscles relax from the work he is doing, or else the

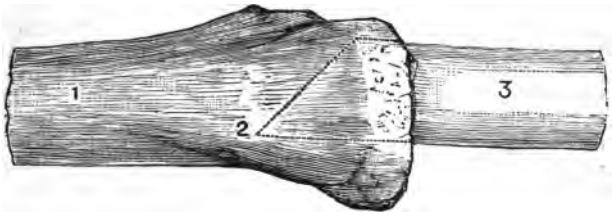
fracture will tend to again assume its faulty position, and be so fixed by the plaster-of-Paris. More failures occur from the employment of a careless or untrustworthy assistant than may be generally supposed. One of the bandages, rolled in plaster, having been well soaked in warm water, is now to be applied firmly, not tightly, from below upwards. Over this a layer of loose dry plaster is laid, which is then well wetted and rubbed in with the hand. Another bandage is now applied over the first, and upon this dry plaster again sprinkled, well wetted, and moulded with the hand. Five layers of the muslin usually suffice to give strength and solidity to the apparatus, and the result is not a heavy cumbersome mass, which, difficult to remove, irksome to the patient, has so often brought discredit upon the method and operator, but a light shapely splint which quite fulfils its object, and is a source of the greatest pride and comfort to the patient. It must be remembered that the plaster soon "sets." In fact, after the application of the third layer, the assistant will begin to feel that the fracture is being held in its new position. He must not on that account relax his attention, but, if possible, rectify any slight displacement in the axis of the limb, or of the fracture, that he may notice before it becomes too late. It is also most essential that the plaster be well wetted and moulded together, the splint then forms one harmonious whole, and does not crack or give way. The apparatus may be removed in five to six weeks, and passive motion cautiously commenced. (Mr. A. Marmaduke Sheild, M.B., Medical Times, Feb. 23, p. 248.)

INJURIES OF THE ELBOW JOINT IN CHILDREN. — *Practical Rules in dealing with.*—(1) Never forget the epiphyses, and that they are the weakest part of the bones. (2) Always suspect that the injury is complicated, in part a dislocation at the joint and in part a displacement at the epiphysal junction. (3) Remember that simple and complete detachments of the lower epiphysis of the humerus are more common than simple dislocations of both bones backwards. (4) Never give a diagnosis, if the case is the least puzzling, without putting the child under ether and making a careful examination. (5) Never be content unless you can easily put the limb up with the elbow well bent. (6) Be very careful to give a guarded opinion to the parents, knowing that in nine out of ten apparently simple dislocations there is damage either to the coronoid process or the lower end of humerus, and that some impediment to free motion is almost sure to result for a time. (Prof. Jonathan Hutchinson, Medical Times, Jan. 5, p. 3.)

JOINT DISEASES.—*Antiseptic Treatment.*—Clinical experience abundantly supports Prof. Lister's views. We may do any kind of operation upon a joint without considering the risk of surgical blood-poisoning. Under some circumstances, where surgeons formerly did right not to interfere, as in some cases of chronic abscess, we are now wrong in withholding antiseptic operation; and excision of joints is certainly put in a much stronger position as compared with amputation; while the relief of tension by puncture, in acute inflammation of bones or joints, is absolutely demanded. It is well worth while for a patient to wait some extra time to save a joint; but, in hospital practice, the time for waiting must come to an end, and I fear my statistics tend to show the futility of hoping, after *pronounced disease of the joint* has set in, to get a successful termination short of excision.—In the elbow-joint, any operation short of excision results in ankylosis, for which excision will be eventually required. In this joint, if I find it necessary to operate at all, and the mischief be not distinctly extra-articular, I shall, in future, excise at once.—In the hip and shoulder, amputation is rarely admissible, and excision gives good results. In the hip, probably, my cases show more unfavourably than they should do for waiting or partial operation. I think disease of the astragalus will usually require amputation of the ankle.—For injury, and in healthy subjects, partial operations would, of course, be comparatively favourable. In the knee-joint only, partial operations for disease seem to be followed by a good result. For the last five years, I have treated my joint-cases requiring an operation by methods short of excision and amputation, and the same practice has been much in vogue among my colleagues; but, in the cases of *thorough disease*, the results have been very disappointing. (Mr. F. Richardson Cross, p. 266.)

RESECTION OF KNEE-JOINT.—*Mr. Davy's New Method of Performing by Tibio-Femoral Impaction.*—On Feb. 13th, 1883, I removed a rectangular wedge of bone from the femur and tibia, cut a mortise in the head of the tibia, and shaped the femur as a tenon; placed the femur in the head of the tibia, and applied direct pressure on the left foot, until impaction resulted up to fixity of tenure. The leg was placed in a splint, and, without a single bad symptom, and without any dressings, the patient made a steady recovery. She gained thirteen inches in height, and walks famously with a cork boot. The annexed woodcut shows well the result of the tibio-femoral impaction (tenon and mortise). (1) The tibia. (2) Wedge-shaped end of femur, driven into the head of the tibia, marked by a dotted line.

(3) Shaft of the femur. The two grand maxims bearing on this operation are:—1st. Maintain the bones in absolute fixity. 2d. Do not meddle with the case from the day of operation until recovery is established. By this new method of tibio-femoral impaction, osseous ankylosis (so to speak) is established before the patient leaves the operating table; and



many surgical contentions are removed, such as the misplacement of the bones by startings, jerks, or inefficient bandaging. In one case the boy had convulsions for twenty-four hours after the operation; and, thanks to the sister's and my own bedside restraint of the ends of the bones, grating injury was partly prevented. The circumstance made a very forcible impression on my mind; and I consider that tibio-femoral impaction relieves the surgeon from this grave source of anxiety. I have constantly seen an excision case neatly and accurately adjusted on the operating table, displaced antero-posteriorly or laterally by the time the bedside is reached; due to the transit of the patient and involuntary spasm; and what surgeon worthy of the name has not felt a pang at so quick a secondary interference? Place your patient's limb at once in a swing cradle, hitching up the side-irons to a convenient height, and, so far as possible, in a position comfortable to the owner. The splint used by me in the above case is a very excellent one for the purpose; fixing the knee, the foot, and the limb; with wide margins at the heel, ankle, and knee; it is capable of the most accurate adjustment. And then, do withhold your interference, either by dressings or readjustments. If your antiseptic dressings are potent enough to kill the supposed germs, they run a risk of killing your patient; cleanliness is all that is wanted; and, in my opinion, the only advantage gained by the antiseptic method is to remind the careless to be careful. There are some who accept the variegated light of a stained glass window, and clerical formalities, as accessories to religious fervour; there are others who can do their duty perfectly well without them. (Mr. Richard Davy, p. 277.)

REMOVAL OF THE TONGUE.—A gag having been introduced, and any jagged teeth likely to be in the way of the operator having been extracted, two threads are passed through the tongue, about an inch behind the tip and half an inch on each side of the middle line. One of these looped threads is now given to an assistant to hold tightly; and the operator, holding the other, scores the dorsum of the tongue with a blunt-pointed scalpel, exactly in the middle line—extending the "cut" well through the mucous membrane into the surface of the muscular substance, and dividing the tip freely down to and through the middle line of the frænum. The cut may be extended back as far as the operator deems necessary—say, for an inch beyond the level of the posterior edge of the cancer. He then takes both threads, one in each hand, and, using the forefingers much in the same way that he would for tightening a ligature on a deep vessel, he splits the tongue into two halves. At this stage of the operation, the hemorrhage is usually very trifling, if the operator has taken care to cut along the middle line; and, even if he is a little to one side or the other, the divided vessels are small, and easily ligatured. The thread which tethers the diseased half of the tongue is now pulled quite taut, either by the operator or his assistant; while the former, with blunt-pointed scissors, snips as far as he considers necessary, the mucous membrane and muscular fibres which connect the tongue with the anterior part of the lower jaw behind the symphysis, after the manner suggested many years since by Sir James Paget. He then "runs" the scissors along the floor of the mouth, immediately beneath the mucous membrane, keeping close to the ramus of the jaw, until he has cut, if possible, to a point beyond the level of the posterior edge of the cancer. Then with his forefinger and occasionally snips with the scissors, he frees the tongue as completely as may be requisite from its attachments in front and at the sides and in the floor of the mouth. The chief point aimed at, of course, at this stage of the operation, is to free the diseased half of the tongue in such a manner that it may be surrounded by the loop of the *écraseur* at some distance behind the disease, and without danger of the cord slipping forward so as to embrace the neighbourhood of the cancer, and much less the cancer itself. This is by far the most important part of the operation; and, should the surgeon be in doubt about his having sufficiently freed the tongue with his finger, he should again introduce the scissors, and cautiously divide any muscle or other structure which prevents the due loosening of the tongue. Having now freed the tongue sufficiently, one, and sometimes two, blunt curved needles

are now made to perforate it at some distance, an inch or more if possible, behind the cancerous mass; and the loop of the *écraseur* is now slipped over the diseased half of the tongue, and adjusted behind the needles. With the screwing-up of the *écraseur*, this part of the operation is now completed, with the exception that, very commonly, at least when whip-cord is employed, the main vessel and some other tissue, perhaps nerve fibres, are pulled through the end of the *écraseur* after the softer substance of the tongue has been crushed through. Under these circumstances, a double ligature should be passed with an aneurysm-needle, and the strand of vessels and nerves divided between the two knots, when the *écraseur* will, of course, at once come away, and the main vessels will be left on the face of the stump securely ligatured. (Mr. W. Morrant Baker, p. 212.)

Removal of Tongue and One-Third of Lower Jaw.—A small whipcord was passed through the tip of the tongue, and another half an inch in front of the hyoid bone. An incision was made through the lower lip, and carried through the integument to a point immediately in front of the upper part of the thyroid cartilage. The lateral flaps were quickly reflected. The bleeding vessels were secured as I proceeded by Spencer Wells's forceps. The jaw was partly sawn through at the points from which the teeth had been extracted, and the division of the bone was completed by chisel and hammer. The separated bone was now seized at its middle portion with the lion-forceps, and rapidly removed by a few touches of a scalpel. The remainder of the gum on each side was separated from the jaw to near its angle. The tongue being now drawn forwards by means of the whipcord, the chain of an *écraseur* was carried to a point just in front of the farther whipcord, and, the upper end of its solid part being pressed well back, the chain was tightened. The handle of the instrument was worked once in twenty seconds by the watch until it had cut through the tongue and the parts below it. The vessels that bled, which were very few, were now tied, and the integuments brought together by carbolised gut sutures. The patient was fed for twenty-four hours by the rectum. A nurse sat by his bedside night and day for forty-eight hours, and drew the tongue forward whenever there was sense of choking. The man went on uninterruptedly well, and was discharged cured on June 25th, 1881, having been kept on as an out-patient for observation. He remains quite well, does his work as groom, swallows soft food, talks sufficiently well to be understood. This operation undoubtedly was not so striking as that introduced and so brilliantly executed by Mr. Whitehead, and I volunteered

to relate it if grouped with Mr. Whitehead's cases, not certainly with a view of claiming any credit, but to enable you to compare the two modes, and to come to an impartial conclusion. I have removed the tongue by knife and scissors, by the galvanic and thermal cautery, and by the chain *écraseur*. I infinitely prefer the last. There has been less bleeding, and the patient has escaped the putrid surfaces inseparable from the hot iron or wire, a very important point. The chain *écraseur* has the overwhelming advantage that you can conveniently and more safely remove the parts underneath the tongue, and so escape, more probably, malignant infiltration. I feel this so strongly that, had I a tongue to be removed for malignant disease from my own person, I should elect to have it done by an incision below the symphisis, to a level of the cricoid cartilage, the mucous membrane being, on each side, separated from the inside of the jaw, and the chain *écraseur* applied so as to remove as much of the tongue and the parts underneath it as possible. In this operation, there is much less blood lost, and much less peril from blood flowing back into the larynx and trachea, a very important matter. (Mr. W. Martin Coates, British Medical Journal, Oct. 20, p. 767.)

SPLINTS FOR FRACTURE OF FOREARM.—*Cocking's Poroplastic Felt.*—This has many advantages over every other material —as wood, leather, or gutta-percha, commonly in use. It has the strength of wood; can be moulded to shape easier than leather, as well as being much cheaper; and must be superior to gutta-percha, owing to its porosity and lightness, besides retaining its shape at a temperature of inflammation, which the latter will not. (*See woodcuts*, p. 261-2.) Poroplastic felt is nothing more than fine felt, from one-eighth of an inch in thickness, according to requirements, saturated with a spirituous solution of gum resin, combined with shellac as the principal ingredient, dried, and so prepared as to guarantee its remaining porous. Mr. Cocking being the patentee of the process, there is no necessity for me to dwell on its preparation. It is quite as strong as wood of the same thickness, readily moulds to any shape at a heat of 180°, and retains its shape when allowed to set, even at blood heat, if held in the position it is required to assume for two or three minutes. The advantages I claim are: 1st, facility with which a fracture can be "put up;" 2nd, doing away with all padding; 3rd, perfect guarantee against displacement by shortening or otherwise; 4th, room, if required, for swelling, by loosening the ties without removal of splint; 5th, no necessity for arm-sling towards recovery, as it answers that purpose at the same time. (Dr. Henry Fisher, p. 261.)

SPLINTS FOR BROKEN LIMBS.—*Moulded Zinc.*—Prof. Guillery, Chief of the Belgium Medical Department, has produced an improved moulded zinc splint, for the rapid and easy treatment of broken limbs. Dr. Guillery chose a number of individuals, of different builds, whom he divided into three groups. In each group, he took a well-developed muscular person, whom he considered as a type. From each of these persons, he had plaster-casts of the arms, forearm, thigh, and legs taken. With the casts thus obtained, an exact counterpart was reproduced, from which the zinc splints are moulded. These splints are so arranged that their corresponding edges are a little distance apart, and may be fixed to the inner and outer sides of the limb, the distance between them being so arranged that they may fit limbs that may not in every way exactly agree with the type from which the original cast was taken. If two of these splints be required for a broken limb, the splints corresponding with the patient's height are selected, and the inside covered with a sheet of wadding, and the fracture reduced as far as possible. The limb is then placed in the splints, which are then secured by bands, which hold them securely in their place. Three sizes have been found sufficient for any case that may occur by Dr. Guillery, who provided for every case of fracture admitted to the Hospital of Saint Pierre during the two years he was chief of the staff of that institution. In the case of a simple fracture, the reduction is made by extension. It is only then necessary to remove the sole of the boot from the wounded leg, and the splints are then placed in position, outside the clothes, and secured by webbing-straps; or the clothes may be removed, and a lining of tow or wadding substituted. If the fracture be complicated by bleeding, a piece of lint may be dipped into a solution of perchloride of iron, and introduced into the wound before applying the splints. Supposing the lint to be carried away, a handful of charpie or lint may then be dipped into a solution of perchloride of iron, and applied to the bottom of the wound. The zinc splint is then cut lengthwise into three or four strips, and the ends turned under, to secure the wadding in its place beneath the stump; after which the splint is secured in the regular manner. A complete box of these splints ought also to be provided, with a pair of stout scissors, or shears and nippers, to bend the zinc; a roll of lint, tow, or charpie; a few bandages; and a concentrated solution of perchloride of iron. These improved zinc splints all fit into each other; they take up but little room; are light, strong, and easily packed. They attracted a large share of attention at Liverpool. They can be procured from Evans and Wormull, 31, Stamford St. (Brit. Med. Journal, Dec. 8, p. 1136.)

WOUND TREATMENT WITHOUT THE SPRAY.—The spray of carbolic acid is useful only in so far as it throws a germicide solution on a wound; it has no effect whatever in rendering the atmosphere aseptic. As, therefore, the spray is not only inconvenient but also useless, it has been entirely abandoned in the wards under my care. It is essential that whatever may come in contact with the wound should be absolutely pure. With the necessary precautions for this purpose surgeons are familiar, as well as with the importance of attention to the minutest detail. What is needed in the laboratory to keep a beaker of fluid or a gelatine dish aseptic, is needed also for a wound. A little matter, but not without its importance is the surgeon's comfort in this respect. Strong solutions of antiseptics injure the skin of the hands and interfere with the delicacy of touch. I have, on the whole, found it most satisfactory to wash first with a solution of carbonate of soda, and then smear the hands with a solution of carbolic acid in glycerine. The glycerine preserves the skin soft and pliable. But given these well-known precautions as to hands, instruments, patient's skin, &c., we have also to consider how best to protect the wound from atmospheric contamination. This resolves itself into two periods, viz., during and after the operation. There is reason to believe that during the operation the chances of contamination are comparatively small. On a surface, three inches in diameter, there will sometimes no germ light in fifteen minutes, and to be certain of a successful cultivation about twenty minutes' exposure of such a surface is necessary. Now, healthy tissue forms, in some respects, an unsuitable soil for the growth of organisms. Let me enumerate shortly the modifications of the Listerian precautions which I am in the habit of using. Those which I do not mention I adopt as they are usually carried out. It is well to wash the hands and the skin of the part to be operated on with a solution of carbonate of soda, and then smear thoroughly with the glycerine solution. After the operation, and during it if it be prolonged or complicated, the wound is also covered with the glycerine. Oiled silk, simple or dextrinised (it matters little which), is soaked in carbolic glycerine, and laid on the closed wound. The object of this is chiefly to prevent adhesion of the outer dressings. The whole is then covered with a large quantity of salicylic wool, a freshly torn surface being placed next the skin. If, on account of oozing, the dressing requires renewal next day, the drainage-tube is then removed; if not, its removal may be delayed for ten days or a fortnight. (Dr. John Duncan, Edinburgh Medical Journal, April 1884, p. 892.)

WOUND DRESSING.—*Cellulose.*—Dr. Fischer of Trieste has made experiments with cellulose as a dressing to wounds, and has found it, when moistened with warm water or some medicated solution and afterwards covered with an impervious fabric, to be a most excellent application in all cases where heat and moisture appear to be indicated. Its chief advantages are—1. It is absolutely free from substances capable of exciting putrefaction. 2. It has a very low specific gravity. 3. It produces neither eczema nor erythema upon the epidermis. 4. It retains moisture and heat perfectly for more than twenty-four hours. 5. It never adheres to granulating wounds on the surface of the skin. 6. It adapts itself perfectly to the outline of the place of application. 7. It is much cheaper than other materials heretofore used for similar purposes. Dr. Fischer has used, so far, only plain water or weak solution of carbolic acid or iodoform in the case of suppurating buboes, and has obtained uniformly satisfactory results. (Edinburgh Med. Journal, Dec., p. 567.)

Iodoform in Prof. Billroth's Clinic.—Billroth's dressing of the wound after operations differs from Lister's chiefly in the substitution for carbolised gauze of iodoform in the form of powder or of gauze. Outside the operating-room iodoform is employed (1) as a powder, sprinkled over wounds, as upon the perineum, by Wölfler's iodoform-duster, and (2) as gauze, which may be either "hydrophile" or adhesive. For the preparation of *hydrophile iodoform gauze*, a coarse, unbleached muslin, which has been deprived of its fatty particles, is placed in a basin, washed with carbolic acid, and sprinkled with iodoform powder until the cloth assumes a yellow colour. According to the thoroughness of this operation, the gauze contains from 10 to 20 per cent. of iodoform. Fifty grammes of iodoform are sufficient to impregnate six and a half metres of muslin. Hydrophile gauze costs in Vienna about eight cents per metre. For the preparation of the *adhesive iodoform gauze* the muslin is saturated with a mixture of alcoholic solution of colophonium and glycerine. The gauze is dried carefully, and impregnated with iodoform in the same manner as the hydrophile. For six metres of gauze it requires 230 grammes of iodoform and 100 grammes of colophonium which is dissolved in 1200 grammes of 95 per cent. alcohol, to which fifty grammes of glycerine are added. This gauze costs about thirty-two cents per metre. The chief use of adhesive iodoform gauze is as a hæmostatic in cases of parenchymatous hemorrhage. (3) *Iodoform glycerine:* This consists of from ten to twenty parts of iodoform to 100 parts of glycerine, and is employed for injection into cold abscesses

after the evacuation of pus. (4) *Iodoform collodium* is composed of one part of iodoform to ten parts of collodium, and is used in enormous quantities in the ambulatorium. It is a sovereign remedy for cuts and slight bruises. (5) An *ethereal solution of iodoform* (one part iodoform and seven parts ether) forms a very convenient covering for syphilitic scleroses and for mucous patches in the buccal cavity. (6) For *iodoform bacilli* the formula is—iod. pulv. xx., gum acaciæ, glycerinæ, amyli, āā ii.; to be formed into bacilli of various sizes. The value of these cannot be overrated when fistulous tracks or inaccessible wound-surfaces have to be treated. In endometritis, cystitis, pyothorax, and certain urethral affections, the bacilli are of great worth. (7) *Iodoform vaseline* varies in the amount of the drug which it contains (from 20 to 50 per cent.), and is used as an application to venereal ulcers. (Dr. Jaggard, Med. Times, Nov. 10, p. 556.)

Wood Wool Dressings.—In Germany the reign of carbolic acid is over, and corrosive sublimate, or sublimate as it is there called, reigns in its stead. Many substances impregnated with sublimate, such as glass-wool, ashes, sand, &c., have been employed as attempts at permanent dressings with greater or less success. Something has still been wanting, something that will absorb a large quantity of discharges, and at the same time remain aseptic. Prof. Bruns, of Tübingen, has hit upon something to which he has given the name of wood-wool (Holzwolla). It is finely ground wood, such as is extensively used in the manufacture of paper. It is a clean-looking, delicate-fibred, soft, yellowish-white substance, having an odour of fresh wood, and it has the characteristic of being able to absorb an immense quantity of liquid. The best wood-wool, *i.e.*, that possessing the highest absorbent properties, was found to be that which was obtained from the *Pinus picea*. The wood-wool thus procured was first pressed, passed through a sieve, then dried and impregnated with a solution containing half per cent. of sublimate and 10 per cent. of glycerine. The processes were first carried out under the personal supervision of Dr. Bruns, but it was soon found desirable to put the preparation of the dressing into the hands of a regular manufacturer. It was accordingly put into the hands of P. Hartmann, of Heidenheim (Würtemberg), whose preparation gave every satisfaction. The wood-wool, impregnated with 5 per cent. of glycerine or not, may be now procured from him. The advantages claimed for this dressing are numerous. It is cleanly, fresh, and of a whitish colour, it is at the same time soft and delicate in texture as cotton, and "extraordinarily cheap." It pos-

sesses some antiseptic properties naturally, has an agreeable odour, and is exceedingly elastic even in thin layers, so that bandages can be put on more lightly with this than with any other dressing. Its absorbent properties are so high that it takes up twelve times its own weight of water, so that ten grms. of well dried wood-wool after complete saturation attain a weight of 130 grms. Dr. Bruns claims that high absorbent qualities in surgical dressings are of vast importance, "as primary wound healing takes place the more readily, the more completely the discharges are conducted from the wound—the drier the wound and its vicinity are kept—as it is under these circumstances that decomposition processes are most securely excluded. If the dressing has absorbed the secretions of the first few days, the evaporation and drying up of the contained moisture should be permitted; then, as the discharge from the wound diminishes, the dressing, now dry, can remain a considerable time as a permanent one. With this object in view, it is indispensable to omit the occlusive layer of the typical Listerian dressing, as the drying of the dressing is prevented by it. With the same object in view I prefer the covering of the wound with glass-wool, in place of the protective, as under this the suture line is of necessity kept moist." In his own clinic the mode of dressing is exceedingly simple. After the wound has been disinfected by copious irrigation with a 1 per cent. ('1 per cent. ?) solution of sublimate, and the drainage tubes have been placed in, the suture line is covered with a layer of glass-wool. Upon this is placed a sufficient quantity of wood-wool either simply wrapped in sublimate gauze or sewn up in the form of a pillow. The latter form is preferred for hospital use. He considers it best then first to place on the wound a small pillow, then a larger one that will widely overlap this in all directions. These are to be fastened on by a firm binder. He summarises the results obtained by him with this dressing between the dates November 1st, 1882, to March 15th, 1883. 180 considerable operations and wounds were treated with sublimate antisepsis, the majority with wood-wool. In the case of those treated with wood-wool the first dressing with few exceptions remained from one to four weeks untouched. Occasionally patches of moisture were visible on the dressing on the earlier days, but within a short time these became dry and remained so, and when the dressings were changed the wounds without exception were absolutely dry and free from irritation. With the exception of one case of erysipelas no complication was observed throughout. (Editor of Medical Press and Circular, Aug. 29, p. 178.)

Messrs. Essinger and Neuberger have submitted to us a sample of the Holtzwolle or Wood-wool which is now used somewhat extensively for surgical dressings in Germany. It is a light, soft, elastic, and very absorbent material, and as such possesses all the attributes of the basis of a surgical dressing. It is employed contained in bags of absorbent muslin of various sizes, and may be used alone or impregnated with some antiseptic agent. This wood-wool saturated with an aqueous solution of bichloride of mercury, 1 in 200, is now used largely as an antiseptic dressing, and with marked success. On account of the ready solubility of the antiseptic agent, it requires to be employed in considerable bulk. We hope that British surgeons will at any rate give this form of dressing a trial. (Lancet, Nov. 24, p. 908.)

AFFECTIONS OF THE SKIN, ETC.

BED-SORES.—*Hypericum (St. John's Wort) Oil.*—My attention was drawn to this remedy, some years ago, by the friends of a patient afflicted with bed sores. From the slight experience of two cases I can strongly recommend it; it appears to induce healthy granulation and a more or less rapid cure, in a manner which we should vainly look for from alcoholic or balsamic preparations—and this without any smarting from the application. The compound oil of hypericum, which alone I have used, is sold by Mr. Garrad, chemist, of Leamington; I have vainly tried to procure it in London. A recipe in my possession directs that bottles be filled half-full with the flowers of the St. John's Wort; olive-oil is then to be added, and the bottles are to stand in sunshine for a few days, till the oil becomes of a deep red colour; it is then fit for use, and may be either drawn off at once, or left till required. It is merely brushed over the sore, two or three times daily, with a feather. Since writing the above note I have been favoured by Mr. Fenn Clark, honorary consulting-surgeon to the Leamington Provident Dispensary, with a communication, from which I subjoin the following extracts: "I see that you have alluded to the value of hypericum oil; may I be allowed to add my testimony, as I have made and used it in my practice for the last twenty years, with manifest advantage in severe cases of bed-sore? It is an old favourite in the country; and our American friends think highly of it also. I observe that you recommend a few days as the time which hypericum oil will require to perfect it. May I mention that my friend, who first introduced it to Mr. Garrad, and to Leamington generally, always recommended a period of three months in a sunny window; as it could not in less time acquire the reddish-brown tint. It is prepared from the

blossoms of the *Hypericum medium perforatum*, which flowers in July." (Dr. H. L. Snow, Brit. Med. Jour., Dec. 8 and Jan. 5.)

CHRONIC DISEASES OF THE SKIN.—*Perchloride of Iron.*—Dr. Casarini, in the *Spallanzani*, states that the external employment of perchloride of iron is highly useful in many chronic diseases of the skin, employed as an ointment consisting of one, two, or three parts to thirty of lard, or as a lotion mixed with two or three parts of water. The diseases in which it is most efficacious are subacute and chronic psoriasis, eczematous lichen, and eczema—after all acute symptoms have subsided. From the cases he has employed it in he draws these conclusions:—(1) The perchloride is a highly efficacious remedy in the treatment of simple and hemorrhagic purpura. (2) It is very useful in the chloro-anæmic condition which often accompanies certain skin diseases, such as rupia, ecthyma, and impetigo. (3) It is employed externally with promptly efficacious results for ulcers dependent on scrofula and constitutional syphilis. (4) Used as an ointment it modifies in a most efficacious manner the squamous skin diseases, and especially psoriasis. (Practitioner, Nov., p. 365.)

ECZEMA.—*Local Measures.*—A very common mistake consists in the too frequent change of remedies. A very good rule to lay down is to persevere in the use of one kind of treatment as long as the case continues to improve. Local applications are by no means uniform in their action, owing to the difference of sensibility of different skins, and for other reasons; hence they sometimes aggravate the skin affection even when used in what appear to be appropriate cases. Almost without exception the first point in the local treatment is to remove all the crusts, and the physician should refuse to prescribe any local applications, unless those calculated to attain this end, till the diseased surface is fully exposed to view. In the scaly and acute inflammatory stage, one of the safest modes of treatment is to dust the parts two or three times daily with an absorbent powder. Among these, Taylor's cimolite is specially mentioned. This is a fine and scarce natural variety of steatite, found most abundantly in Spain, and composed principally of silicate of magnesia: it is perfectly bland and unirritating, and has a smooth, oily feel. To any of the powders used a little powdered camphor may be added to allay the burning heat. A very good application is a cold potato-starch poultice, a small quantity of absorbent powder being sprinkled on its surface. The most soothing ointment is that of which the formula is as follows:—℞. Bismuth oxidi, ʒ j: acidi oleici, ʒ j; ceræ albæ, ʒ iij; vaselini, ʒ ix; ol. rosæ, gutt. j. M. For the removal of infiltration of the

skin in chronic cases, soft soap, liquor potassæ, and solutions of caustic potass are all useful. While these preparations are being used, cold water forms a very agreeable and useful adjunct. The affected parts may be bathed with it, or the water poured over them from a height by means of a watering-can, or cloths wrung out of it may be laid on the parts in the intervals between the other applications. These means ameliorate the itching and substitute pain; and sedative lotions or ointments may also be used at intervals, rather *than giving way to the desire to scratch.* (Dr. McCall Anderson, Edinburgh Med. Journal, Nov., p. 461.)

Tarry Preparations in Eczema.—In many cases it is more appropriate to prescribe tarry preparations in the form of ointments than of lotions, particularly when the parts feel stiff and rigid, and when there is a tendency to the formation of fissures. As a lotion he strongly advocates a mixture of equal parts of common tar, soft soap, and methylated spirits. Tarry lotions tend to discolour the parts to which they are applied, and not uncommonly prove too stimulating, and then are apt to aggravate, instead of removing, the eruption. The colour can be rendered paler and the lotion diluted, and at the same time the combination is miscible with water, by mixing mineral tar and spirit in certain proportions and adding a little strong solution of ammonia. ℞. Picis mineralis, ʒ ij; sp. rectificati, ʒ ij. Cola et adde: Liquoris ammoniæ fort., ♏ viij.; glycerini (Price), ʒ vj.; aquæ distillatæ, ʒ xij. Such a mixture forms a yellowish emulsion with water in all proportions. It can be sponged on two or three times a day. Mr. Wheeler of Ilfracombe has informed Dr. Anderson that he has discovered that by the addition of laminaria saccharina, as prepared by him to pix liquida, it is miscible with water in all proportions. Carbolic acid, best employed in solution, the strength varying with the degree of chronicity of the skin disease, removes at once the fetid odour which often exhales from eczematous surfaces, counteracts the itching, and sometimes heals up the excoriations and ulcerations with remarkable rapidity. While emollient ointments, which depend almost entirely upon their oily ingredients for their beneficial effect, are best applied spread on rags, stimulating ones should, as a rule, be melted on the point of the finger and rubbed firmly into the affected part, and none should be allowed to lie undissolved upon the skin; nor, in most instances, should their colour be perceptible after their application: the surface should merely have the appearance of having been recently moistened. The part may occasionally be cleaned with white of egg and soft tepid water (rain water, if possible), for if layer after layer be smeared upon the skin

it becomes rancid, acts as an irritant, and is calculated rather to be prejudicial than otherwise. (Dr. McCall Anderson, Edinburgh Med. Journal, Dec., p. 570.)

ECZEMA CAPITIS. — In the ordinary eczema of the head in children, so commonly met with in dispensary practice, after two or three thorough cleansings, the daily application of the following salve nearly always suffices to obtain a rapid and lasting cure. ℞. Acid. salicylic. gr. x; tinct. benz. ℥xx; vaselini ʒj. M. ft. ung. On other parts where a soft, easily melting salve such as this is not suitable, or where a firm dressing or a drying effect is desired, the following paste should be rubbed on. ℞. Acid. salicylic. gr. xix; vaselini ʒj; zinci oxidi, amyli, aa. ʒss. M. leniter terens, fiat pasta. (Dr. McCall Anderson, Edinburgh Med. Journal, Sept., p. 280.)

ECZEMA OF THE HAIRY PORTIONS OF THE FACE. — This is generally a tedious complaint at the best, so that much perseverance is required, though the ultimate result is satisfactory. Strong local stimulants, such as the empyreumatic oils, are generally the reverse of useful. It will commonly be found that shaving the parts thoroughly every day is a necessary adjunct to other treatment. The soothing ointments usually indicated should be spread on pieces of linen, which are to be kept constantly applied; but some patients refuse to make use of them by day, which is the very time when the surface is exposed to the influence of cold winds, hot sun, irritating particles, etc., and most requires them. Under these circumstances the parts may be protected by means of Dr. James Provan's tragacanth paste:—℞. Tragacanthæ, glycerini (Price), āā ʒiv; boracis, ʒss; aq. distil., q. suff. Fiat pasta. The part should be painted freely with the paste, then allowed to dry. It can be washed off with soft water. The scoops devised by Auspitz of Vienna are of great service. After shaving and applying linen spread with diachylon ointment for several days, the most prominent pustules are opened with the conical point, and then the whole surface is firmly scraped with the scoop, so as to remove all pustules, crusts, etc. This process is repeated several times a week, the parts being kept covered continually with the ointment in the intervals. In this way brilliant cures are often effected. Epilation and the subsequent use of a stimulating ointment are to be reserved for such cases as resist all other modes of treatment. In strumous cases the best results are to be expected from the use of cod-liver oil in full doses (two or three ounces per day), combined with the continuous application of the oil to the affected surface. (Dr. McCall Anderson, Edin. Med. Jour., April, p. 960.)

ENLARGED GLANDS, RHEUMATIC AND OTHER PAINFUL AFFECTIONS OF JOINTS AND MUSCLES, ERYSIPELAS, &c.—"*Colourless Iodine.*"—Sulphurous acid added to the liniment or tincture of iodine of the Pharmacopœia produces a colourless solution. I have used this combination for years with very satisfactory results. The liniment of iodine bleached in this way, and suitably diluted is invaluable in ozæna and in most diseases attended with fetid discharges. For chilblains, before the skin breaks, it is excellent as a paint, and, if used early, cures them. For enlarged glands, rheumatic, and other painful affections of joints and muscles, erysipelas, for many cutaneous diseases, and generally wherever iodine and sulphurous acid may be used externally, this combination will be found most useful. It does not stain the skin. It may be used as paint or spray, or diluted as a lotion or injection. (*See* p. 31.) (Dr. James Leatham, Liverpool, Lancet, Nov. 24, p. 935.)

ERYSIPELAS.—*White Lead Varnish.*—(1) Take half a pound of white lead, and thoroughly mix with mastic varnish to the consistency of a thick paste. (2) Take forty grains of sulphate of copper, forty grains of sulphate of zinc, and forty grains of acetate of lead. Rub them together in a mortar till they form a thick paste; this they do in about five minutes. (3) Then mix these two pastes thoroughly together. (4) Add about an ounce of linseed oil, so as to make the compound of the consistency of paint. The varnish causes the paint to crack, so as to be easily removed. The lead acts as the body of the compound. The sulphates and acetate act as rapid driers to the linseed oil. (Dr. Ed. O. Day, London, Lancet, April 5, p. 648.)

ERYSIPELAS AFTER VACCINATION.—On Oct. 2nd I vaccinated seven children, whose ages varied from three to eight months. All the children were vaccinated from the same lymph out of the same tube, and from the same child I had previously vaccinated between seventy and eighty children without any unpleasant results. The children of A, B, and C, of the seven vaccinated on Oct. 2nd, presented symptoms of erysipelatous inflammation about the vaccine marks on the twelfth, thirteenth, and fourteenth days afterwards. A, whose first symptoms appeared on the fourteenth day, speedily recovered. B, whose symptoms appeared on the thirteenth day, is now recovering and able to go out of doors; and C, whose symptoms were set up on the twelfth day, had a very violent attack, the inflammation spreading to the chest, abdomen, left leg, and left side of head and face, the case terminating fatally on Oct. 23rd. The remaining four children never had the least unpleasant symptom, there being very little irrita-

tion about the marks. The sanitary surroundings in the case of two of the children, A and C, and who were next-door neighbours, were far from being satisfactory, and there were cases of erysipelas and diphtheria in the town at the time. Upon inquiry I found that the clothes worn by the three children had been washed with a certain kind of soap, and the clothes of the remaining four children had been washed with the regular washing soap, and the irritation in all the cases began as an eczematous rash in the vaccinated arm. I was led to the inquiry as to the kind of soap used from the fact that on the 14th of October a washerwoman presented herself at my surgery with both her arms up to the shoulders one mass of inflammation, having the same peculiar appearance, and upon inquiry I found she had for the first time in her life washed a whole day with the same kind of soap. I have on previous occasions had trouble after vaccination, and I have been able to trace it, in my opinion, to the clothes having been washed with the same kind of soap, and I have been in the habit of cautioning parents not to use that soap to children's clothes. (Dr. Philip S. Fentem, Bakewell, Lancet, Dec. 8, p. 1010.)

NAPHTHOL IN THE TREATMENT OF SKIN DISEASES.—Dr. Arthur Van Harlingen, of Philadelphia, reports the results of his experience with the use of this drug, which was first brought to the notice of the profession by Prof. Kaposi, of Vienna, about two years ago. He finds it is one of the most efficient and agreeable remedies for *scabies* which has as yet been brought forward. Both in the rapidity of its action and in its beneficial effects upon the inflamed skin it is superior to any of the means ordinarily employed for the cure of this disease. Its exact place in dermatic therapeutics remains to be ascertained, but he is inclined to think that it will not prove an unimportant one.—In *eczema* it has failed in his hands to give the same beneficial results as were obtained by Kaposi. In most cases of vesicular and in acute eczema generally its action is simply that of an irritant. On the other hand, it has a limited field of action in the cure of a certain number of cases of squamous eczema of the scalp.—In his opinion it is a valuable addition to our external means of treatment in *psoriasis*. Kaposi speaks well of it in psoriasis of the scalp in particular, and his experience would lead him to place it near chrysarobin and pyrogallic acid in effectiveness without the neutralising disadvantages of either of these drugs.—In *seborrhœa* of the scalp naphthol is a decided addition to our means of treatment. While inferior in some respects to sulphur or carbolic acid, it has a certain range of usefulness which further experience will in all probability

more exactly demonstrate.—Naphthol is highly lauded by Kaposi in the treatment of *hyperidrosis*, but in Dr. Van Harlingen's hands it has failed entirely, although used strictly according to his formulæ. He considers it quite valueless in this disease, so far as his experience goes.—His experience leads him to regard its effects in *ringworm* as inferior to almost all of the remedies at present used, and as almost entirely inefficient in most cases of *tinea versicolor*.—In *pediculosis* he has had no experience, but in a single case of pediculosis capitis its action was favourable. (Dr. Harlingen, Glasgow Med. Journal, Feb., p. 74.)

SCABIES.—The formula employed by Kaposi in the treatment of *scabies* is as follows:—℞. Axungiæ, ℥viii.; saponis viridis, ℥iss.; naphtholis, ℥iv.; pulvis cretæ albæ, ℥ii. M. In hospital practice a single energetic application of this ointment is made over the affected parts, after which the patient is thoroughly powdered with starch, and wrapped in a linen sheet. In private practice, under-garments of linen are placed upon the patient after powdering the anointed skin, and he can then go about his ordinary avocations. Dr. Harlingen uses an ointment of four scruples of naphthol in one ounce of vaseline. (Dr. Harlingen, Dublin Med. Journal, Feb., p. 189.)

SURGICAL USES OF COLLODION. — Collodion is one of those therapeutic agents of which the value to the surgeon is admitted, without being adequately appreciated or utilised. Composed of ether, gun-cotton, and spirit, collodion is a powerful anti-putrescent; and, by ready evaporation and contraction, it exercises the dual antiphlogistic power of refrigeration and compression. In acute orchitis I know no plan of treatment so simple, rapid and satisfactory, as coating the cord and scrotum with layers of collodion, by the aid of a camel-hair brush previously dipped into it. The sensation is momentarily sharp, the shrinkage rapid, and so is the subsidence of the inflammatory process—facts pointed out some thirty years ago by Bonnafont, but much doubted and almost forgotten. To swollen parts which cannot well be bandaged, collodion is especially applicable for the compression attending its contraction. I was lately consulted in the case of a good-looking boy considerably disfigured by a red and swollen nose, which became very pale and visibly contracted, just after I painted it with successive layers of collodion. I repeated the application three times in the succeeding fortnight, with the effect of producing shrinkage of the organ to its natural size and colour. When the nasal bones are fractured, a very effective mould for keeping them immovable, after

adjusting them with the fingers, may be thus made: place over the nose a thin layer of absorbent cotton soaked in collodion; as it dries another layer of cotton and more collodion, taking care that the application extends sufficiently on each side to give buttress-like support. The patient compares the feeling to the application of a firm bandage on the nose, and the bones consolidate effectively under the shield, which may be renewed as it cracks and peels off. Other cuts than recent ones do well under collodion. A horse-breaker sought my advice for a grazed wound inflicted by a carriage step on the front of his right shin, ten days previously. He had applied water-dressing continuously. The surface of the sore had suppurated, and its edges, for some distance round, were red and tender. I raised the foot, to empty the limb of blood, dried the surface of the sore with absorbent tissue, then brushed it over with collodion, and applied a smoothly compressing bandage over one of my pads. The part was easy at once, and with two more dressings at intervals of four days, cicatrisation was perfect; the patient having continued his business of riding and driving without losing an hour. (Mr. Sampson Gamgee, Birmingham Med. Review, Jan. 1884.)

TRAUMATICIN AS A MEDIUM FOR THE APPLICATION OF CERTAIN SUBSTANCES IN DISEASES OF THE SKIN.—Considerable attention has been given lately to the application of remedies to the skin in adhering layers. Prof. Pick was the first to point out the use of gelatine for this purpose. Prof. Auspitz advocates the use of traumaticin (which corresponds to the liquor Gutta Perchæ, B.P.) as a vehicle for chrysarobin in preference to gelatine. The gelatine layer peels off in a few hours, and must be re-applied. Traumaticin forms a much thinner and more delicate covering than collodion or gelatine, and for this reason causes neither tension nor pain. Traumaticin is of itself a neutral covering and protective remedy. Ten per cent. solutions, even when applied to large surfaces on children, or on adults, have never caused irritation. It also causes much more uniform pressure than gelatine, is much more easily manipulated, and does not decompose. After the greater part of the scales have been removed by a soap bath, a ten per cent. solution is applied with a stiff bristle paint brush, to all the existing patches. When the eruption is limited to a few and small patches, the solution is applied daily; when large surfaces are involved, every second or third day. A previous soap bath, when the reproduction of scales is very great, or simply a local wash with soap, when the scales are scanty, is advisable. Many patches,

after one or two applications, already appear a great deal flatter and are covered mostly around the borders only, with scales. After two, at most twelve applications, the infiltration and scales disappear, and in their place white spots bounded by a red or violet-brown line appear. In a few cases of limited extent, the psoriatic process was stopped in from three to six days, by daily application, without bathing or washing. In spite of the frequent application of the remedy to the face, and in psoriasis universalis, to almost the whole external surface of the body, no inflammatory conditions of the healthy tissues—in the form of conjunctivitis, diffused redness, painful swelling, acne, furuncles, eczema, or as fever, or disturbances of the whole general organism—were observed. Parasitic diseases, herpes tonsurans, eczema marginatum, and prurigo can be treated in the same manner. In prurigo, chrysarobin traumaticin was applied in ten per cent. solutions to adults and in five per cent. solutions to children. Usually the itching was immediately alleviated. In a few cases, after two to six applications, the nodules had disappeared. That chrysarobin, however applied, does not prevent the recurrence of the disease, need not be mentioned; and the word *cured* above is only to be understood as meaning that the existing patches had disappeared. Traumaticin is as good an excipient for pyrogallic acid and for salicylic acid as for chrysarobin. (Prof. Auspitz, Dublin Med. Journal, Feb., p. 189.)

WARTS.—Dr. Cordes, of Geneva, states that he has always found the following application successful:—Iodine six, crystallised carbolic acid twenty-one, and alcohol two parts and a half by weight. After scraping the wart or cutting it down to a level with the skin (without causing it to bleed), he touches the wart with a few drops of the above solution. In a minute it becomes soft, and allows of another scraping and a new application; and sometimes even a third scraping and application can be made without causing bleeding. (Medical Times, Nov. 24, p. 609.)

VENEREAL AFFECTIONS.

GONORRHŒA.—*Belladonna Injections.*—An injection was ordered composed of seven ounces of water, an ounce of mucilage of acacia, twenty grains of extract of belladonna, and twenty grains of sulphate of zinc, a teaspoonful to be injected immediately before and after micturating, and a similar amount the last thing at night, great care to be used in passing the injection fully down as far as the pain was most intense. An ointment of spermaceti and mercurial ointment, ʒ iv. each,

and ten grains of extract of belladonna, ten grains powdered opium, a paste to be smeared along the perineum and around the crura penis at night. The treatment answered admirably. My patient left next morning having had no chordee that night, and the pain of micturition disappeared by using the injection. Within a week there was complete cure. I am firmly convinced that gonorrhœa is simply an inflammation, and nothing more specific so far as it is induced by inoculation with urinous pus in a urinous, and therefore foul passage, intractable and painful because subject to be washed frequently by a most irritating and heating fluid, the urine, and like other inflammations of mucous membrane liable to extend to the entire extent of parts connected, and as the part inflamed is highly sensitive, the subject is liable to be attacked with much constitutional disturbance. The consequence is the expressions of any other habitual disease, or of those ailments to which the diathesis of the patient may incline. Prof. Hamilton, of Aberdeen, has shown that there is no change in the epithelium mucous membrane of the urethra in acute gonorrhœa, excepting analogous to what takes place in the bronchi in bronchitis. In fact there is no organic specific difference in the inflammation which takes place in the urethral membrane from that which occurs in the bronchial membrane. (Dr. John Roche, p. 330.)

AFFECTIONS OF THE EYE AND EAR.

Atropine and Calabar Bean in Eye Cases.—Two classes of drugs have been found to exercise special and peculiar effects upon the size of the *pupil*. One class, of which atropine may be regarded as the type, dilates the pupil, and another class, of which calabar bean, or its active principle eserine, may be taken as the type, contracts the pupil. These two classes of drugs are the sheet anchors of ophthalmic therapeutics, and a knowledge of their action furnishes the key to a large part of ophthalmic pathology. Pupil dilators, or mydriatics, are essential to the cure of iritis and for the prevention of its recurrence, and pupil contractors, or myotics, are almost equally certain and effectual in the cure of the slight forms of true glaucoma, and for the relief of severer forms. In inflammation, the iris becomes gorged with blood and filled with inflammatory products, so that the pupil is diminished in size, and, may be, becomes blocked and occluded with lymph. The aim of the surgeon is to prevent this occlusion. The surest way of doing this is to apply locally some powerful mydriatic, so as not only to empty the iris as far as possible of stagnant blood, but also

by dilating the pupil, to prevent the effusion of lymph on to the pupillary area of the anterior capsule of the crystalline lens. Atropine is the most convenient mydriatic. Mydriatics are of further use in iritis, in so far as they afford physiological rest to the inflamed tissue of the eyes, and rest, as you well know, is an indispensable factor in the repair of all damaged tissues. In using atropine you should take care not to mistake other forms of inflammation for iritis. It has been known for many years that the application of a solution of atropine to the eye may be quickly followed by a sudden and violent outbreak of acute glaucoma. Every ophthalmic surgeon of much experience must have seen eyes that have been blinded from the application of a single drop of atropine. I am, however, convinced that these eyes were already on the verge of glaucoma, and only needed the slight bias which the action of the atropine could impart in order to complete the disaster. From the casual observation that atropine sometimes precipitated glaucoma, it was empirically suggested that calabar bean being antagonistic to atropine might be serviceable in relieving or checking glaucoma. Accordingly, calabar bean was used in this tentative manner for the relief of glaucoma, and often with decided benefit, long before any rational explanation of its mode of action was forthcoming. We can now supply this explanation. As I have already explained, whenever an eye is lapsing into the glaucomatous state, that is, when the anterior chamber has become shallowed from the advancement of the periphery of the iris, so that it lies in apposition with the cornea, the application of a mydriatic, causing the radial fibres of the iris to contract, tucks as it were the mass of the iris into the angle of the anterior chamber, and leads to a complete arrest of the drainage through the spaces of Fontana. In such an eye glaucoma is always more or less imminent, and in such atropine should always be avoided. (Mr. John Tweedy, p. 335.)

CATARACT.—In choosing the initial operation which is to be performed upon any particular patient, you will be guided in your selection of a method by various considerations. If no anesthetic is to be given, and there is no direct constitutional contra-indication, the corneal incision will be preferable, partly on account of its comparative insensibility to pain, and partly because by this method the vitreous humour is less likely to be lost through involuntary spasmodic movement on the part of the patient. If there be some special reason for preserving the integrity of the pupil, you may, in isolated instances, elect to run the hazard of a Brussels operation; but you will, in my opinion, largely increase

your chances of success if you carry your incision nearer to the corneo-scleral margin, and supplement it with iridectomy. This latter form of operation, I have reason to believe, finds the most general acceptance amongst modern ophthalmic surgeons. I have little doubt, however, that the majority of them would be ready to adopt a different mode of proceeding, should special circumstances suggest that such a course would be preferable. I have recently operated on a clergyman, who, at his first interview, conveyed to me the somewhat alarming information that, if he accidentally cut or scratched himself, the wound invariably showed signs of sloughing, and took an inordinately long time to heal. I should have regarded it as little less than an act of recklessness to pass my knife through his cornea: and, in the operation which I performed upon him some weeks since, I limited my incision strictly to the sclerotic. His recovery has been unusually slow, but I am glad to say the final result has been most successful. I point out to you the corneal operation as one to be avoided also in patients of very advanced age or enfeebled constitution, especially when analysis of the urine has revealed degenerative renal changes.—Guided by experience, in operating upon the second eye of an individual, I should seriously contemplate the advisability of endeavouring to remove the lens in its capsule. Whilst dealing with the question of capsules, I must not omit to mention Dr. Knapp's very ingenious and valuable suggestion that, in cases where we suspect the cataract to be somewhat immature, or to have ripened with unusual rapidity, we shall lessen chances of traumatic iritis from irritative lenticular fragments by incising the capsule at its margin only, so that the soft lens-matter which remains after the nucleus has made its exit may rest within the shelter of its natural protector, to be dealt with at a subsequent period. (Mr. Anderson Critchett, M.A.Cantab., British Med. Journal, Nov. 17, p. 955.)

CATARACT OPERATIONS.—Von Graefe's section was made by puncture, counter-puncture, and division of the intervening bridge of tissue, by means of the slender straight knife now so widely known by his name. The centre of the section was just outside of the corneal margin, while its extremities were separated from this margin by an appreciable interval; and one advantage claimed for this situation was that the wound had no tendency to gape, but that its edges fell spontaneously into contact, and were placed in tissue possessing sufficient vascularity to promote rapid and easy healing. On the other hand, it was before long rendered manifest by experience that the situation, whatever might be its advantages,

had also its peculiar dangers. If the section were at all unduly prolonged, or if either the puncture or the counter-puncture were placed at all too far back, the extremities came distinctly into the ciliary region, to which, indeed, they were always perilously near; and it is well known that wounds of the ciliary region have been fertile sources of sympathetic ophthalmia. (Mr. Carter, Med. Times, p. 39.)

Eserine in Cataract Operations.—One of the most frequent and most troublesome complications is the entanglement and adhesion of the iris at one or both of the angles of the wound, an accident which, at the best, is followed by drawing up of the pupillary aperture to a point above the centre of the cornea, and which, at the worst, leads on to destructive inflammation. Of late years, the separation of the active principle of the Calabar bean has given us, in the shape of eserine, a drug of very great value in many ocular maladies; and not the least of its uses depends on its power of producing contraction of the pupil, by which the iris may be drawn out of the angles of the operation wound, and pulled well down into the anterior chamber. When once a piece of iris is cut out, and the continuity of the sphincter of the pupil is destroyed, there is nothing left which opposes any resistance to the exit of the lens; and the benefit which was once supposed to be obtained from atropine was probably in a great degree imaginary. At any rate, the loss of this benefit is very cheaply purchased by the gain of preventing entanglement of the iris; and so, at the present day, the instillation of eserine, as a preliminary to iridectomy, has become almost universal. As in the case of atropine, the tendency of the pupil to return to a state of medium dilatation on the evacuation of the aqueous humour may to a great extent be checked by causing this evacuation to occur very slowly, but this is not a matter of much practical importance. Even if the pupil return to medium dilatation at the time of the operation, the effects of the eserine will speedily reassert themselves, and the iris will be kept well away from the wound angles before it can possibly become adherent to them. During the progressive stage of cataract, moreover, when the iridectomy is often required as a preliminary operation, and especially in cases of small nucleus, it is, as I have already stated, not uncommon for the lens as a whole to be enlarged by swelling of the cortex as a consequence of the imbibition of fluid during the degenerative process. When this occurs, the iris is pushed forward and the anterior chamber narrowed; and, in these circumstances, the pupillary contraction brings the iris between the

lens and the entering knife, and is of great value in protecting the former from being accidentally wounded. On all grounds, therefore, whether in performing cataract extraction as a single operation, or in performing iridectomy as a preliminary step, the use of eserine to produce contraction of the pupil is important. (Mr. R. B. Carter, p. 106.)

Cataract Knives and Incision.—The incision by puncture and counter-puncture requires a very narrow, thin, straight knife, with a fine point and one cutting edge. There are two patterns, that formerly employed by Linnhardt for flap extraction, which was adopted by Von Graefe and is commonly called by his name, and that of Dr. Bell Taylor. Von Graefe's knife has its back and edge parallel to each other, and its point is made by an equal sacrifice of both. As described by himself, the blade should be two millimetres broad, and three and a half centimetres long. Taylor's knife has a straight back, and is of the same length as Von Graefe's, but it may be likened to a very narrow Beer's, except that its point is wholly produced by the slope of the cutting edge. There is not much to choose between these forms, but, on the whole, I think that Taylor's encounters the less resistance of the two, and that its shape affords a better edge for the completion of the section.—The external points of puncture and counter-puncture were placed by Von Graefe on the same horizontal line, two millimetres below a tangent to the vertical meridian of the cornea, and on the tangents to the horizontal meridian. The margin of the true cornea, on its anterior surface, and especially at the upper part, is partially concealed by a covering of conjunctiva, through which the point of the blade would enter and emerge; while the centre of the incision would coincide with the apparent corneal margin, and thus be somewhat anterior to the true one. I do not think the position thus described can be widely departed from with advantage.—It is desirable, from an optical point of view, and also as a matter of appearance, that the iridectomy should be directly upwards, so as to be concealed by the upper lid; and it follows that the section should be bisected by the vertical meridian of the cornea. In order to secure this, whenever an anæsthetic is employed, the surgeon must be careful to note some landmark, some vein on the surface of the eye, or some spot on the iris, by which to be sure of the position of the vertical meridian. When under an anæsthetic, the eyes are often much rotated, and an incision which appears to be rightly placed when it is made, may be found, after recovery, to be very oblique in its direction. (Mr. R. B. Carter, p. 107.)

Operation for Cataract.—The patient being placed upon his back on a couch, with his feet towards a sufficient window, the surgeon, standing behind his head, first carefully adjusts a speculum in such a manner as to keep the lids sufficiently apart with the minimum of pressure. He then takes the knife in his right hand for the right eye and in his left hand for the left, with the cutting edge upwards, and with the free hand seizes the conjunctiva, or if this be very fragile, the tendon of the inferior rectus, with fixation forceps, as near to the cornea as possible, and exactly on the vertical meridian. The fixation forceps should terminate in rather blunt extremities, with which, when needed, pressure may be made against the eyeball. The eye being thus secured, and slightly rotated downwards, the surgeon enters the knife at the spot indicated in the diagram, endeavouring to turn its edge somewhat, but very slightly, forwards, and carries it downward through the anterior chamber, close in front of the iris, to a spot a little below and to the nasal side of the centre of the pupil. By this course, the perforation of the anterior chamber is a little lower than the external puncture, and the internal wound is made at least as large as the external one. The point of the knife is then raised until the back of the blade becomes horizontal, and is pushed on to the selected spot for the counter-puncture, great care being necessary not to be deceived as to the position of the blade by refraction through the aqueous humour or cornea. When the point of the knife emerges, the blade should have its back directed downwards and backwards, towards the centre of the corneal curvature, with the edge upwards and forwards in a corresponding degree; and, when the position is correct, the surgeon has only to complete the section. It is usually desirable to rotate the eye slightly outwards with the fixation forceps, so as to avoid wounding the eyelids, or the side of the nose; and then the section is completed, with Von Graefe's knife, by a gentle sawing movement, or with Taylor's, by simply pushing the blade straight onward. If, when the counter-puncture is made, the surgeon finds that the flat of the knife is parallel with the plane of the iris, so that the incision would not have the requisite forward direction, and that its centre would be placed too far back, it is necessary slightly to rotate the blade before enlarging the wound; but this proceeding is to be avoided whenever possible, because it tends to bruise the iris near the extremities of the incision, or in parts which will not be removed by the iridectomy. The section being completed very slowly, the aqueous humour leaks out and elevates the conjunctiva, so that this is not touched by the edge of the knife until after

it has completely cut through the corneo-scleral junction. The edge is then directed backwards, and made to cut through the loosened conjunctiva two or three millimetres farther back, so as to leave a flap which may be turned down over the cornea by the blade.—The next step is the *iridectomy*, the object of which is merely to break the continuity of the sphincter and to avoid bruising or stretching of the fibres. The iris forceps should be introduced at the centre of the wound, carried to the edge of the pupil, and opened just widely enough to seize the narrowest possible fold. This should be gently drawn out of the eye, cut off with scissors up to its peripheral margin on each side of the forceps, and then cut, not torn, from its ciliary attachment. The remainder will generally at once return into the anterior chamber.—The *division of the capsule of the lens* is a proceeding which has much exercised the minds of inventors, and many ingenious instruments have been contrived for the purpose. I think there is nothing better than a simple steel point, set upon a flexible platinum stem, which can be bent with the fingers to suit the depth of the eyeball and the shape of the orbital margin. The operator should fix the eye at the original point whilst introducing the cystitome with its point directed laterally, but should make no pressure with the forceps, or should rather lift the eye towards him, until the point has passed beneath the lower margin of the pupil. It should then be turned down into contact with the lens capsule, and the least pressure with the fixation forceps will render the eye more tense, and will project the lens against the point. This should then be drawn gently to the equator, and then along the equator, in a direction parallel to the section, before it is withdrawn. As the capsule is divided, the lens may generally be seen to start forward, as if released, and a portion of the softened cortex will usually at once escape from the eye.—At this stage, it is often desirable to remove the speculum, and to raise the upper lid by a simple elevator, which, if the operator requires both his hands, may be committed to a careful assistant, who, at the same time, may draw the lower lid gently towards the lower orbital margin. The best elevator is, I think, that contrived by Dr. Noyes, of New York, which holds the lid securely, and takes up but little room. With or without fixation—which only becomes necessary when the eyeball is rolled upwards by the action of the superior rectus muscle, and which must then be managed with the greatest care, for fear of rupturing the hyaloid membrane and permitting the escape of vitreous—the operator makes gentle pressure immediately below the cornea, in a direction backwards, with the back of a tortoiseshell

or caoutchouc spoon. Under this pressure, the nucleus should begin to turn, and its upper margin should present itself between the lips of the wound. The spoon pressure should then be continued in an upward direction, and the nucleus will gradually emerge, the pressure being relaxed as soon as its widest part has passed through the opening. The lids should then be suffered to close. In a few moments they should be reopened, the eye surface cleansed from cortex and coagula by gentle touches with a morsel of soft and carefully disinfected sponge, and the pupil and the wound examined. If the pupil be clear and black, and if the wound contain no iris, the operation is complete. If, on the other hand, the pupil be occupied by cortical substance, this must be extruded by gentle pressure, and by friction upon the cornea through the lower lid, or, if necessary, removed by the gentle introduction of a small spoon or scoop. Incarcerated iris may be replaced by a delicate whalebone spatula, or by gentle friction at the angles of the wound. (Mr. Carter, p. 107.)

Anæsthetics in Cataract Operations.—The improved methods of operating are mainly due to anæsthetics, and would not have been brought to their present perfection without them. It would certainly not be practicable, in a large proportion of conscious patients, to plan and execute an incision, within very accurately defined limits, at the summit of the cornea; for the simple reason that the instinctive tendency of the superior rectus to roll the eye upwards, and to remove it out of the way of injury, would frequently be too strong to be resisted; while, if this tendency were overcome, against the efforts of the muscle, by forceps traction, there would be frequent laceration of the conjunctiva, and there would be frequent loss of vitreous, at quite an early period of the operation, from rupture of the hyaloid by the struggle between the forceps and the muscle, a struggle which may even now be witnessed, and which is not seldom attended by hurtful consequences, in cases in which the anæsthesia is incomplete. Still less would it have been possible, without the passive eye afforded by an anæsthetic, to carry out the series of almost experimental operations, of slight variations in the position and magnitude of the section, of which the procedure that I have endeavoured to describe is the final outcome; so that, without anæsthetics, I do not believe that either the broad lines of the operation could have been successfully defined, or that those lines could have been strictly adhered to in practice. Against the great benefits of freedom from pain, from apprehension, from hurry, and from restlessness of the eye, there is, according to my experience, only a single counterbalancing disadvantage, namely, the

harm which may possibly arise from obstinate vomiting. I have only seen one instance, already referred to, in which the effects of such vomiting were destructive; I have seen many in which vomiting of moderate severity has been productive of no ill result whatever.—Judging from my own opportunities of observation, I am inclined to believe that the best anæsthetic, for general use in ophthalmic surgery, is the mixture which is commonly known as A.C.E., and which contains one part by measure of absolute alcohol, two of chloroform, and three of ether. A mixture of ether and chloroform was long ago suggested by very obvious considerations, but it was not found to succeed well in practice. It was merely a mixture; and, as its ingredients were of different degrees of volatility, they evaporated unequally, and left the administrator in a state of uncertainty with regard to the proportion of each which might be left in his inhaler at any given time. The addition of alcohol provides a solvent for the other two, and they evaporate together. The mixture should be administered freely, from a flannel or felt cone, and the desired effect should be produced as rapidly as possible. To prolong the administration of an anæsthetic, of whatever nature, to give small doses timidly, with frequent admissions of air between them, is, I believe, the most certain method of producing disaster from its imperfect operation. By disaster I do not mean death, but incomplete anæsthesia, prolonged struggling, muscular spasm, and probably eventual sickness. The cases which do best are those in which the effect is rapidly produced, and in which it is as rapidly recovered from. It would be foreign to my subject, and beyond the limits of my time, to attempt to describe the precautions with which the use of every anæsthetic should be surrounded, but I may add that one advantage of the A.C.E. is the ease with which the mixture can be replaced by pure ether in cases which seem to call for such a substitution. When this substitution is made, moreover, the patient being already narcotised by the A.C.E., the pure ether has little tendency to produce the excessive bronchial secretion which constitutes one of the difficulties of its employment from the first. I need only add, that, more especially in cataract operations, the ophthalmic surgeon who cares for the welfare of his patients, or for his own reputation, will not lightly commit the anæsthetic to strange or unskilled hands, but will insist upon obtaining the aid of an administrator of skill and experience, who knows the special requirements of eye work, and who is capable of relieving the operator from the duty of thinking at all about the anæsthetic or its effects. The administrator should then assume entire responsibility

for his share of the proceedings, and the surgeon should await his permission to commence. (p. 175.) (Mr. R. Brudenell Carter, Medical Times and Gazette, Jan. 12, 26, and Feb. 9, pp. 35, 103, 171.)

DEAFNESS.—*The Cotton-Wool Pellet of Yearsley.*—The use of the cotton-ball or pellet of Yearsley, or some modification of it, is now generally preferred by aural surgeons to the India-rubber disc. The cotton is sometimes used dry, especially when it is intended to soak up moisture in the ear; but a moistened ball of cotton is, in my experience, much more effective in improving the hearing than dry cotton. I generally moisten it with glycerine, well diluted with water, or with vaseline; if there be still suppuration, I find it advantageous to the suppurative process to soak it in a suitable astringent or antiseptic solution. The cotton may have the form of a ball, or it may be disc-shaped; in the latter case, I employ two or three layers of surgeon's lint, connected together with thread, in preference to cotton-wad; while a piece of thread attached to it, and which lies in the canal of the ear while the cotton is in position, enables the patient to remove it at will. When I am satisfied of the usefulness of the cotton-pellet, I carefully instruct the patient in the method of introducing and withdrawing the cotton by means of fine forceps having a weak spring. Very frequently, after such training, the patient becomes much more dexterous than the surgeon in manipulating with the cotton in the ear. The use of the cotton has the following advantages over Toynbee's artificial membrane. 1. It is softer and excites much less irritation. 2. It is a convenient medium for applying astringents or other medicaments to the interior of the ear. 3. It does not cause disagreeable noises in the ear during chewing, as does the wire of Toynbee's membrane. And 4. It is not visible at the orifice of the ear. (Dr. Thos. Barr, p. 348.)

ENTROPION.—Simple or senile entropion is a sufficiently serious and troublesome affection to cause any method of relieving it to be welcome. Dr. Bell Taylor's ingenious clip, as described in the Lancet of Sept. 29th, is a new and valuable addition to our list of means of giving relief, more especially after cataract operation; but still a method is wanted where operation is contra-indicated or refused, which will be efficacious and yet not unsightly. I purpose therefore to describe a plan I have found answer admirably in a case of senile entropion with absorption of orbital fat, setting up an irritative conjunctivitis with free muco-purulent discharge. The application of collodion and strapping had been tried with some benefit, but was much disliked by the patient, who at the

same time was decidedly opposed to any operative interference. The patient wears constantly a pair of spectacles in which the ordinary bridge has been replaced by a spring, as in pince-nez glasses. This spring is of sufficient strength to firmly grip the tissues on each side of the nose over the frontal process of the superior maxillary bone, and by drawing down the skin from the inner canthus before applying the spectacles the eyelashes can be effectually and easily kept from irritating the conjunctiva or cornea. Ordinary pince-nez glasses were useless, as the patient has so much difficulty in keeping them constantly on in all positions of the body. Fortunately in this case the state of the refraction allowed a pair of plus lenses to be always worn, but where this would not be suitable pantoscopic glasses might be ordered. The advantage of the method is that there is no disfigurement of the patient as there is with strapping or the clip. During the night, when the spectacles would not be worn, eversion can easily be kept up by means of carefully adjusted strapping. (Mr. C. Knox Shaw, St. Leonards-on-Sea, Lancet, Dec. 1, p. 972.)

OPACITIES OF THE CORNEA.—Dr. Michel recommends sulphate of cadmium, of the strength of two and a half grains to the ounce of mucilage, as an application to opacities of the cornea. A camel's-hair brush, dipped in this wash, is applied to the centre of the spot and retained in contact with it for a few seconds. At first the application is made once a day, but after a while is repeated two or three times in the twenty-four hours. When the pain grows less, the strength of the solution may be increased to five grains or even seven grains to the ounce. When the opacity is of recent formation it rapidly disappears under this treatment, but when it is of old date the applications must be long continued. (Practitioner, Jan., p. 53.)

PAINFUL ULCERS OF THE CORNEA.—The treatment by warmth and eserine is very easily carried out. The patient is directed to foment the eye for fifteen or twenty minutes three or four times a day, or oftener. The fomentation should be used as hot as can be borne, and may consist of simple hot water, decoction of poppy-heads, or camomiles. A solution of one or two grains of sulphate of eserine to an ounce of water should be dropped into the eye three or four times a day, after the fomentations have been used. A large pad of cotton-wool, thoroughly warmed before a fire or over a spirit-lamp, should be laid upon the closed eyelids, and secured by a bandage, and replaced by a freshly warmed one as often as may be necessary for the patient's comfort. The patient should be allowed to go about; dark rooms and confinement

to the house always make matters worse. He should be well fed; purged if necessary; and placed on some tonic, none being better than iron in some form or other. Stimulants are rarely needed, and in many cases will do harm. The treatment by warmth without eserine is most useful in many painful inflammations of the eyes. It was first, I believe, recommended by Mr. Liebreich. (Mr. Charles Higgens, p. 332.)

In illustration of the treatment of these cases, Mr. Teale, of Leeds, gives the following case, which in his absence was treated by Mr. R. N. Hartley. April 22nd. C. F., aged 5, from the north of Yorkshire, had had the right eye amiss eight months, and had been under treatment the whole time. The eye was never seen for five months, on account of severe photophobia. For three weeks pain had been more severe, causing great loss of sleep. The general surface of the cornea was hazy. Under anæsthesia by ether, three or four patches of superficially eroding ulceration were seen. A small ulcer near the centre was commencing to suppurate. An incision was made by Gräfe's knife, just below the centre of the pupil. The eye and conjunctiva were syringed with carbolic acid lotion (1 to 100), and nitrate of silver was applied to the outside of the lid. On April 27th, the father reported: "No loss of sleep since the operation, nor pain. He began to look about him on the third day." When seen on May 14th, he was quite well; no treatment whatever having been used after the child came round from the ether. The cornea was clear; the ulcers almost sound; the mark of the incision was scarcely visible. There was no photophobia; no pain. On July 1st, the father wrote that he was "perfectly well," and could see with the "late afflicted eye" as well as with the other. (Mr. T. Pridgin Teale, British Medical Journal, Nov. 3, p. 866.)

SQUINT.—Von Graefe used to make an incision directly over the insertion of the internal rectus, expose the tendon, and divide it on a small hook. This procedure involved either an open wound or a suture, and in order to obviate the inconvenience attending the insertion and subsequent removal of a thread, I have been in the habit of making an incision directly over the lower border of the internal rectus muscle, inserting a small hook beneath the tendon, causing the extremity of the hook to project beyond its upper border and cutting on the point, thus dividing the attachment of the tendon under the small bridge of conjunctiva, which is allowed to remain. In this way we have a small puncture and counter-puncture, but no open wound, and the tendon, and the tendon only, is divided as readily as though it had been laid bare. (Dr. C. Bell Taylor, p. 345.)

SYMBLEPHARON, OR ADHESION OF THE LIDS TO THE EYE IN INJURIES.—*Transplantation of Cornea of the Rabbit.*—The patient is put under chloroform, and also, at the same time, two rabbits; one being kept in reserve in case of accident. In this connexion I may mention that I find the grey wild rabbit more suitable than either the white or black; the conjunctiva in it is tougher and stronger and stands handling better. Dr. Noyes of New York also recommends black instead of white rabbits. I then separate the adhesions, so that the eyeballs can move in every direction. I then if necessary enlarge the external palpebral opening of the rabbit so as to enable me to evert the lid better for dissection. Ligatures are then introduced into the conjunctiva of the rabbit to mark the extent of the membrane to be removed; by means of the ligatures it is put on the stretch and dissected with strabismus scissors. The membrane is spread out on the back of my hand and left to dry there while I finish the preparation of the part for its reception. The flap is cleaned and trimmed, after which it is slightly moistened and then removed to its new site. It is now at once stitched to the fore border of the lid which is at the same time strongly everted, spread out carefully, and secured at the *cul-de-sac*. I generally find eight ligatures sufficient to keep the transplanted membrane in its place. The ligatures are left in for four or five days before they are removed. For the last contribution to the literature of the subject I am indebted to Dr. Noyes of New York, who has in some particulars modified my method of proceeding and some of whose suggestions merit consideration. He reports that, soon after the operation was announced by me, he made trial of it, and that he was on more than one occasion aided by Dr. Little, who was then (1873-4) his assistant in the New York Eye and Ear Infirmary, and who has recently published a case of his own. In describing his operation Dr. Noyes says:—"When it [the flap] has been separated, I put it into a saucer of tepid water and fasten it on a submerged piece of cork by the points of threaded needles. I now trim it to proper shape; next I carry it on the cork to the eye, and run two of the threads from the piece into their places in the patient's eye. Then, taking out the needles from the cork, draw their threads from the piece and pull it into its place and lay it out smoothly. I apply it to the eyeball, and cover as much of the lid and globe as possible. To make the *cul-de-sac*, the stitches are brought through the eyelid and tied over a bit of stick on its outer surface. As many as ten stitches or more may be required to hold the piece in place." (Dr. J. R. Wolfe, Glasgow, p. 340.)

THE MAGNET IN EYE CASES.—If a magnet be approached to an eye containing a metallic splinter, its influence on the chip will often be noticeable. McKeown thus, by observing a supposed particle "quiver," learnt its nature, and Williams also ascertained that a fragment lying on the iris was steel and not stone. In one of my cases, several facts of interest and value were learnt after this manner. On approaching the sclerotic with the electro-magnet (needle not attached), a mass of lymph in the vitreous body, which was presumed to contain a fragment of steel, was noticed to spring about, and follow the magnet from point to point, and to recede on withdrawing the instrument. The experiment taught the following facts: 1. The presence of a foreign body and its nature; 2. That the adhesions around it were of the loosest character, and this notwithstanding its presence in the eye for six weeks; 3. Its removal was feasible. I may add that it was readily extracted with the needle of the electro-magnet through a sclerotic incision. Taking for his principle that, if a fixed magnet attracts a movable piece of steel, a fixed piece of steel must attract a movable magnet. Dr. T. R. Pooley of New York made a series of experiments with a suspended magnet, to ascertain if by this means any help could be afforded in the diagnosis of particles of steel or iron. The suggestion was apparently new as far as ophthalmic surgery was concerned, but the employment of the magnetic needle had been suggested and adopted in general surgery by Smee, Aveling, and others. Sir B. Brodie, also, before the Royal Medical and Chirurgical Society in 1876, related the interesting and successful experiments on his son, who had a needle in his leg. (Mr. Simeon Snell, British Med. Journal, Nov. 17, p. 957.)

MIDWIFERY, AND THE DISEASES OF WOMEN.

ANTIGALACTAGOGUE.—*Iodide of Potassium.*—In a recent case of excessive secretion of milk after weaning, I have found the above drug of great service. The child had been weaned more than a week, and the breasts were very large, hard, and tender. Belladonna and aconite, applied freely, together and singly, had failed; this, although combined with firm compression of the breasts by a bandage, and the administration of salines and purgatives—a form of treatment generally successful. Ten grains of iodide of potassium were taken three times a day, and decided relief was obtained after the fourth dose. In all, 160 grains were taken, and then all trace of swelling had disappeared. With each dose I gave half a grain of quinine, as I always do when giving

the iodide in rather large doses. There was no symptom of iodism. Before taking the drug internally, my patient had used the iodide and soap liniment for two days without much benefit, and continued to use it till treatment ceased. As long ago as 1858, Roussel, and, in 1861, Delmas, recommended the iodide, and were supported by Dr. Morris of Cheltenham in 1864. Dr. Dolan, however, in the Practitioner of 1881, quotes Dr. Morris, but reports that the drug, given by himself in larger doses than Dr. Morris had used—namely, fifteen grains against a drachm—had produced no effect. At the time of my case, I had not seen these papers, and was led to use the iodide solely on account of its known action on glandular tissues. I could find no mention of it in Ringer, Woods, Bartholow, or Phillips. (Mr. T. J. Verrall, Brighton, British Med. Journal, Dec. 8, p. 9.)

Chronic Inversion of the Uterus.—*Operation for Replacement.*—The result is to be attained not by a strong or violent effort, not by great force, but by a small force long applied. Not great force and short time, but little force and long time. Not the driving a nail, or lifting a weight, but the bending a bow or pulling a fish by hook out of a stream. Not the rapid opening of the womb in forced delivery, but the gradual opening in natural labour. Formerly, a great effort was made by taxis, as in the reduction of a hernia, and if it failed the case was hopeless; now the taxis is tried, and if it fails the pressure is kept up till yielding comes and the difficulty is overcome. You may first make a trial of immediate replacement. The woman, anæsthetised, is placed in the position for bimanual examination; the right hand is passed into the vagina; pressure is by it exerted on the fundus uteri, while counter pressure is maintained by the left hand on the peritonæal uterine cup through the hypogastric flap. Without the counter pressure the vagina would be undoubtedly stretched and, it may be, injured, and the right hand would pass far into the abdomen to follow the retreating or ascending uterus. The pressure on the fundus by the right hand is variously modified, this way or that, directly, obliquely, the rule generally held in mind being to replace first the highest part or that nearest the cervix, and so on. The pressure soon pushes the body within the cervix; and you may, therefore, suppose you are succeeding, when, in reality, you have not touched the real difficulty. Efforts may be continued long; even for hours. I have persevered till the woman was exhausted and I myself fatigued, and have failed, and I have also succeeded. This process may be called acute replacement, and should always be used in

acute inversion, that is, when the inversion comes after delivery. At this time it should be strenuously urged till you succeed: sometimes it is very easy. (Dr. J. Matthews Duncan, p. 360.)

DISPLACEMENTS OF THE UTERUS.—*Hodge's Pessary.*—Retroversion of the uterus cannot occur without displacement forwards of the upper end of the vagina. When simple prolapse of the uterus takes place, the vagina becomes inverted, its upper part (with the uterus) sinks into the lower, and this inversion increases with the degree of the prolapsus until the vagina becomes turned inside out. If we prevent this inversion of the vagina from taking place, we prevent the uterus from coming down; and if we hinder the upper end of the vagina from moving forwards, we hinder also the cervix uteri from doing so, and thus prevent retroversion. This is the function of Hodge's pessary: to prevent inversion of the vagina, and to prevent the upper end of the vagina from moving forwards. It does this by filling that canal with a relatively rigid frame. This effect a properly fitting Hodge always produces; its effect upon the shape and position of the uterus is not always the same, and is in many cases unimportant. Hodge's own account of it is the following:—The instrument "operates as a lever in elevating the fundus from its malposition against the sacrum to its normal position behind the bladder; that portion of the pessary which is posterior to the neck of the organ being the 'short arm,' while all anterior to the neck is the 'long arm'; and the 'fulcrum' or support is the posterior surface of the vagina. As the long arm or horn is depressed by the finger of the practitioner, the short arm rises and carries with it the body and fundus of the uterus." I have no doubt that Dr. Hodge in this passage describes correctly the change in the position of the pessary which followed the manipulation mentioned; but before accepting it as representative of the effect of expulsive abdominal effort, we need be certain, that the pressure of the finger was applied in exactly the same direction as that communicated by the anterior vaginal wall during effort. The simplest and the parent instrument—the one with which Dr. Hodge started, and out of which his pessary arose—is the ring. A rigid ring, large enough to fill the vagina, cannot usually be introduced without difficulty and pain to the patient, and its pressure when *in situ* is likely to be injurious. Therefore an elastic ring, the opposite parts of which can be pressed together for the purpose of introduction, and which does not exert unyielding pressure, is preferable. If the ring be thick, its pressure is more diffused, and therefore less likely

to cause pain or ulceration than if it be thin. A thick elastic ring, such as is made of watch-spring, covered with india-rubber, is therefore the best. This form of instrument is stated to have been originally devised by Dr. Meigs, of Philadelphia. The Meigs ring is the simplest and safest of all vaginal pessaries. Assuming that the case is a suitable one, the only disadvantageous mistake that can be made in the application of such a ring is the choice of too large a one. If this error be committed, the unsuitability of the instrument will soon be evident from the pain it will cause the patient. But if the pessary be of proper size—that is, big enough to fill the vagina, without making it tense—its thickness and elasticity so diffuse the pressure which it exerts, that it is rare for any ulceration of the vagina to be produced. I have used these rings largely, and have never once seen ulceration result from them. The ring pessary, when retained, fulfils the main requirement—it prevents inversion of the vagina, and thus prevents prolapsus. It carries the posterior *cul-de-sac* of the vagina backwards, and thus in the same manner as a Hodge, and in most cases as effectually, prevents retroversion. Even in some cases where the ring did not when first introduced correct retroversion, I have found the uterus in the natural position after the pessary had been worn a few weeks. The thick elastic ring is especially useful where the uterus, besides being displaced backwards, is tender, or where the ovaries are prolapsed and tender; for in these cases the thick elastic pessary presses so much more gently than the rigid bar of a Hodge, that it can be borne where the latter is not tolerated. I would venture to offer this practical advice: whenever the uterus is tender, and you are not sure, after applying a Hodge's pessary, that the uterus is raised into a position of anteversion, or at least into the axis of the pelvic brim, you will do well to substitute a Meigs's ring for a Hodge. (Dr. G. Ernest Herman, p. 352.)

The Medicated Tampon in Uterine Displacements.—We are all familiar with the great power glycerine exerts in abstracting fluid from an œdematous tissue; but it may not be equally well known that this power is very much enhanced when the glycerine contains alum in solution. Moreover, the presence of alum, by virtue of its astringent properties, gives tone to the vaginal wall and the uterine wall and supports. The tampon, therefore, when saturated with a solution of this salt in glycerine, and properly applied in flexions or versions, acts in three different and beneficial ways—1st, as a support; 2nd, as a depleting agent; and third, as an invigorating agent to the uterus and vagina. (Dr. Robert Bell, p. 365.)

ERGOT AND ITS USES IN OBSTETRIC PRACTICE.—None of the bodies isolated—alkaloid or acid—can replace in therapeutics the drug itself, the medicinal activity of which is due to the whole of its chemical constitution. Consequently, we should, when possible, use the freshly prepared powder. For hypodermic injections we should for the present use the ergotine of Bonjean. In its application to obstetric cases we shall notice first the suggestion made some years ago—I think first by Meadows, of London—to use it with a view of preventing miscarriage. Though I do not think it the best remedy for this purpose, still, it may be used with a fair prospect of success up to the conclusion of the third month of utero-gestation, but after that time its administration is more likely to precipitate than to avert the disaster. When miscarriage is inevitable, we should not use it till the uterus is emptied of its contents: the safety of our patient largely depends on this being done thoroughly, and the early use of ergot will rather hinder than help its accomplishment. During the first stage of labour, at full term, nothing except the occurrence of formidable hemorrhage justifies us in using it—an observation which applies equally to the second stage, at least, till there is every prospect of its speedy termination. The presence of inertia in either stage calls for suitable treatment in each individual case, and in the majority of them we shall effect much more with safety to our patient by the wise use of opiates, stimulants, and nourishment, than by stimulating an already exhausted uterus by repeated doses of ergot. When given just before birth it is a valuable preventive to hemorrhage, both post-partum and secondary, and helps to prevent undue delay in the third stage. If the placenta be not expelled by natural efforts and moderate pressure within fifteen or twenty minutes after ergot has been given, we should satisfy ourselves by a digital examination as to its position. The necessity for this will be clearly shown by the following case, which occurred in my own practice a few years ago:—Ergot had been given simply as a precaution just before birth, and finding, after a delay of about twenty minutes, that moderate pressure was not sufficient to expel the placenta, I ascertained by vaginal examination that the uterus had closed on it, the cervix barely admitting the passage of my finger. It is needless to add that I at once passed my hand into the vagina, and after a gradual dilatation of the os with two fingers, easily effected the removal of the uterine contents. When chloroform has been given during labour, the propriety of using ergot before its termination is especially indicated, for thereby we render the occurrence of hemorrhage much less likely. It must be

admitted that in some cases of post-partum hemorrhage ergot affords us but little help in establishing that firm and persistent contraction of the uterus on which the patient's safety depends. I believe this is sometimes due to the use of faulty preparations, and sometimes to an idiosyncrasy in our patient. We must remember, too, that when arterial tension has been much lowered by the loss of blood or any other enfeebling agency, absorption by the stomach takes place slowly and imperfectly, and we are much more likely to attain the desired end by hypodermic injection. With much more confidence, however, we can have recourse to it in the prevention and treatment of the numerous forms of systemic disturbance which retard convalescence during the puerperium. The more closely we observe our cases the more we shall become convinced of the truth of Winckel's observation that most commonly some point in the uterus is the portal through which septic matter invades the system, when it may either be arrested by some localised inflammation, such as pelvic cellulitis, or rapidly diffuse through the circulation, producing the various forms of blood-poisoning. This being so, it will be easily admitted that in a firmly contracted condition of the uterus lies our chief safeguard against such evils. Hence for many years it has been my habit to give the infusion of ergot with sulpho-carbolate or hyposulphite of sodium three or four times daily. Especially is this useful when hemorrhage has occurred, or from any cause the uterine action during labour has been feeble. Again, in metritis the same treatment will speedily remove the pain and tenderness, so that the trouble of frequent poulticing can be avoided. (Mr. R. D. Purefoy, p. 381.)

MAMMARY ABSCESS.—In cases of threatened mammary abscess, I have for many years, with very successful results, given three consecutive doses of ten grains of quinine at intervals of twelve hours, at the same time using the usual local application of belladonna. The administration of quinine in these cases, although its anti-suppurative power is well known, is not practised by anyone with whom I have conversed, but I have myself found it so successful that I think it deserves to be in general use, especially as the disease is so painful and so exhausting to the system. The best cases for the treatment are those occurring during lactation, and it is less suitable immediately after labour. It is unsuitable if the bowels are confined and the tongue furred. There are some patients who do not bear such large doses of quinine, in which case a first dose of ten grains may be followed by two of five grains each. I originally saw this treatment recommended in a French medical journal, and claim therefore no originality.

I have frequently seen the pain and tenderness disappear within forty-eight hours, although a little hardness will remain for some days or longer, and the inflammatory symptoms may recur, and may be again at once checked by the same treatment. A recurrence, however, is rendered less likely if the belladonna is continued for a time, although pain has ceased. No doubt some will say that the success of the treatment is owing to the belladonna, and not to the quinine. I used the belladonna for years before I used the quinine in addition, and was struck with the greater rapidity and certainty of the result when the quinine also was used. At the same time I admit the difficulty, when two drugs are employed, of apportioning to each its real value. (Dr. James Braithwaite, Lancet, Dec. 15, p. 1064.)

POST-PARTUM HÆMORRHAGE.—*Vinegar.* — About ten years since, I attended a patient who had most violent post-partum hemorrhage, so severe, indeed, that I began to despair of arresting it. I had no ergot with me, and ice was not procurable. I directed the attendant to give a wineglassful of pure brandy. The uterus, which was before flaccid, contracted instantaneously under my hand, and the bleeding ceased. On proceeding to give some more brandy, I discovered that the patient had been given vinegar instead of brandy. The effect was so marked, that I inquired of the old midwife who was with me, whether she had ever heard of vinegar being used before; she informed me that in her part of the country it was considered an excellent remedy, but that she had rarely, if ever, used it. When lecturing to a class of pupil-midwives shortly afterwards, I mentioned the case, and advised them most strongly to give the vinegar a trial in case of need. It seems to have escaped my memory until, about two years ago, the midwife at Queen Charlotte's Lying-in Hospital reminded me of my recommendation, and told me she had given vinegar repeated trials, and preferred it to ergot on account of its certain and instantaneous action. She was such a reliable and clever midwife, that I felt her testimony might be taken. Since then I have carefully questioned all my pupil-midwives as to its action, for until recently it was never used in the hospital. They all agree that, in their cases of hemorrhage in the out-patient department, where they were allowed to use vinegar, hemorrhage was arrested much more quickly than in the hospital with ergot. It was not until recently that I had a good test-case; the patient belonged to a family of "flooders;" her mother and two of her near relations had bled to death. As soon as the child was born, she began to flood. I expelled the placenta, and gave a wineglassful of vinegar. The uterus,

which was very flaccid, and constantly dilating, at once contracted firmly under my hand; it did not again relax, although the hemorrhage continued to a moderate extent. At the end of fifteen minutes I gave a second dose, about two-thirds of a wineglassful. In both instances it was given pure, without any water. This soon arrested the hemorrhage, and the patient did well. I used no other means beyond holding the uterus, as I was perfectly satisfied with the result. I feel certain that I should not have obtained such favourable results with ergot. The action of vinegar is so rapid, that I refrain from using it or permitting its use before the placenta is expelled, for fear of causing a retention of that body and making its removal difficult. From my own experience, and from the reports obtained from my midwives, pupil-midwives, and house-surgeons, I can confidently recommend the use of vinegar in post-partum hemorrhage. It is a remedy, if not always at hand, at any moment procurable, simple and harmless, not open to the objections against ergot, which in the hands of midwives is very liable to be used to hasten delivery, nor to the serious disadvantage and dangers of intra-uterine injections. If further trials, on a more extended scale, confirm my experience, I have no hesitation in saying that vinegar will have to be regarded almost as the specific for post-partum hemorrhage. (Dr. W. C. Grigg, British Med. Journal, Jan. 12, p. 56.)

PROLAPSUS UTERI.—*Operation on the Round Ligaments.*—The plan I have followed is to wind the ligament, when pulled out, round a piece of stick, and leave it like a pedicle projecting through the wound, to fall off naturally; so that a sort of stump can be seen in the cicatrising part, that is, if healing be primary. I unwound the ligament from the sticks in two instances. I found the band measured two and three inches respectively. In all cases, full antiseptic precautions were taken, and the subsequent dressing was Listerian until suppuration appeared. I do not think, however, that anything more than strict cleanliness and careful adjustment of the wound is necessary, together with sponge-pressure and a gauze bandage; whilst the sooner the ligament is found, the less handling will the tissues be subjected to, and the less disturbed will they be in consequence. Careful stitching of the ligament, both deeply and superficially, is no doubt most important for the lasting success of the operation; and Dr. Alexander's recommendations, as to the "method of retaining the ligaments in their new position," should be strictly adhered to. (*Retrospect*, vol. 87, p. 393.) In the last case operated upon, a sponge was placed in the vagina, and changed daily; it was retained without causing any discom-

fort, and was probably useful in steadying the uterus whilst healing went on; and I can imagine that, in cases where chloroform caused sickness, or ether set up bronchial irritation, such a practice might prove beneficial. (Dr. Henry A. Lediard, p. 362.)

RETROVERSION OF THE GRAVID UTERUS. — *Treatment.* — In principle it is simple, and in practice it is generally easy and successful. The urine is drawn off, and the uterus is replaced. Often nothing more is required; and all this may be done in a few minutes. But let us suppose we have a case of some duration, and in which there is some difficulty. The woman is sent to bed; the lower bowel is evacuated; the bladder is emptied by catheter. Then the patient is placed in the genu-pectoral position, and so as to have negative abdominal pressure, the anterior abdominal wall hanging loose or bagged; and this a woman can do on having the matter explained. In the genu-pectoral position negative abdominal pressure is the natural condition, and in this position gravity helps the fall of the uterus from the pelvis into the abdomen. If it do not fall, pressure is applied to push it into the abdomen. The axis of the pelvic brim is nearly vertical, and the direction of pushing is nearly in this axis, and it is effected by two fingers in the vagina, or, still better, in the rectum. You are not to expect the uterus to be replaced at once; and you are not to use great violence, for you may perforate the posterior uterine wall by your fingers. You push strongly, nearly as strongly as you can, by the ends of your fingers, and the womb gradually leaves the pelvis. The patient is made to lie down; the uterus is now felt above the pubes, and a vaginal examination discovers the pelvis empty and the cervix in its natural situation. Lest the womb should come down again, the woman should lie quietly in bed for some days. Care has to be taken that the bladder is regularly and completely evacuated, spontaneously or artificially. In cases where you fail to replace you may simply wait, keeping the bladder empty, and the uterus may ascend spontaneously, as in one of our recent cases. If, on waiting, the case becomes worse, symptoms of strangulation of the uterus in the pelvis coming on, you proceed to evacuate the uterus. This I have never had to do. It is effected in the same way as abortion is, in other circumstances, induced, but with difficulty in consequence of the position of the os uteri, and the narrowness and length of the passage to it. Sometimes it is induced by withdrawing the liquor amnii through the vagina and posterior uterine wall by trocar and cannula. (Dr. J. Matthews Duncan, Medical Times, Dec. 1, p. 622.)

PRACTICAL MEDICINE.

DISEASES AFFECTING THE SYSTEM GENERALLY.

ART. 1.—ON MALARIAL POISONING.

By WM. JOHNSTONE FYFFE, M.D., Deputy Surgeon-General.

Professor Tyndall exclaims with characteristic enthusiasm: "The physician and the sanitarian have no longer to fight against phantoms—their enemy is revealed. It is not noxious gases, but organized germs—contagia are living things. Men and women have died that bacteria and bacilli might live!"

The *materies morbi* of malarial fevers is an organic germ floating about in the air we breathe, and capable of introduction into the human system through the medium of the food we eat or the water we drink. The pathological effects of the malarial poison upon the human organism are protean in their forms; varying from the intense saturation of the system, as evidenced by the most deadly form of paludal fever, attended with stupor, coma, and death in a few hours or days, to the gradual, slow, but sure process of infection exhibited among persons who have resided all their lives in marshy and malarious districts, and who present those signs of chronic malarial poisoning which once seen can never be forgotten. Scarcely any organ in the body seems to escape the influence of this poison, and this too may be seen in persons who have never had an attack of ague or fever in their lives.

As an instance of the rapid and disastrous results of this poison in its most virulent form I may recall the celebrated Walcheren expedition in 1804. The expedition was one of the most magnificent which ever left the shores of England, and consisted of a force of 36,481 rank and file, and 1,738 officers. The campaign, if such a name can be given to a military spectacle which lasted less than six months, and consisted in the occupation of a wretched little swampy island and the capture of one small town, was one of the most disastrous this country was ever engaged in from the effects of malarial poisoning. Twelve thousand fell sick in the island of Walcheren and 36,000 within six months after it was evacuated; within 50 days after the landing of the force on the banks of the Scheldt, there were from 7,000 to 10,000 men in hospital with malarial fever; the deaths were from 25 to 80 daily, and it was estimated that had the force remained

in Walcheren for 250 days it would have been entirely destroyed. Those who escaped death in Walcheren, returned to England bringing with them the pathological evidences of the terrible nature of the poison to which they had been subjected; intermittent and remittent fevers, diarrhœa, dysentery, dropsy, liver and spleen enlargements. This was an instance of malarial poisoning in its most virulent form.

I had an opportunity myself of observing the effects of slow malarial poisoning during a residence of four months in Bulgaria with the army under Lord Raglan. The troops were encamped on rough uncultivated ground, often in the vicinity of marshy lakes. There was great heat during the day with cold and dewy nights; fogs and mists prevailed, the food was insufficient and of inferior quality, and before long it was apparent that the strength of this splendid force was being gradually sapped. Many of the strongest became sickly without being able to define what was the matter with them; severe and fatal remittent fever prevailed. In the course of a few weeks regiments which, when they left England, seemed capable of going anywhere and doing anything, had become scarcely capable of accomplishing a march of five miles. The men were pale, weak, and anæmic, and, in short, in the condition to which Vogel gives the term of malaria chlorosis. Men in such a condition fell an easy prey to the epidemic of Asiatic cholera which attacked them, and the force altogether became so enervated by chronic exposure to malarial poisoning, that in 22 days after landing in the Crimea, 5,053 were disabled, of whom 353 were killed at the battle of the Alma, 1,867 were wounded, and 2,237 were sent sick to Scutari suffering from one or other of the many forms of malarial poisoning. No theory of chill, or sudden alteration of temperature, can account for such widespread attacks of illness among a body of men of such splendid physique, and so full apparently of life and vigour, as they were before they landed in Bulgaria.

Have we not an argument in favour of the germ theory of malarial fevers in the fact of their being generally amenable to treatment by quinine? How does quinine act? We know that it is an antipyretic and antiperiodic. We give it in large doses in fevers and other diseases attended with hyperpyrexia; and we do so with confidence. We know almost to a certainty that it will answer our expectations. For if there be such a thing as a specific remedy, it is surely quinine in the treatment of malarial fevers. But by what power it acts in this way we know not. In the absence of proof to the contrary it is at least justifiable to surmise that it acts by its antiseptic properties, by its destructive agency on the specific germs of fever in the blood.

If we accept the theory of a special malarial poison, it is not unreasonable to assume that quinine exercises its special curative power in rendering this poison inoperative within the body, and its special prophylactic power by rendering the blood unfit for its reception and development. Briefly then to sum up the proofs of the existence of a special malarial poison germ, short of its actual demonstration, we may thus express them:—

First.—Malarial fevers have a period of incubation followed by fever-storm.

Second.—They have special organic lesions.

Third.—The destructive effects of the poison upon the blood are demonstrable by actual observation.

Fourth.—The evidence of the communicability of the poison through potable water is, to say the least, very strong.

Last.—The influence of antidotes, such as quinine, arsenic, eucalyptus, in counteracting the effects of the poison is clearly manifest.

I cannot close without alluding to the efforts which are being made, at least in one notorious locality, to meet and fight the enemy on its own ground. The Roman Campagna, in long ages past the site of large cities, has been notorious for 2,000 years for its malarious fevers. Who does not think twice even now about advising a friend or a patient to pass a winter in Rome? The ancient inhabitants of Rome knew the dangers which were close to their walls; a whole system of drainage has been recently discovered in this locality, which has arisen as it were from the grave of a long buried past to rebuke with bitter irony the apathy of the present generation. It seems, however, that at last something in the way of practical effort is about to be made to mitigate the dangers of this notorious plague spot. The late General Garibaldi, unpractical and visionary as he may have been, fervently desired the removal of the evil, and conceived and agitated some wild scheme for the drainage of the Campagna.

The Trappist monks, whose mission in life is prayer and the tilling of the soil, have been at work for some years in the locality. The Italian Government gave them a large tract of ground on condition that they planted 100,000 trees in ten years. They established the farm of the Tre Fontane and began planting the eucalyptus; thousands of these trees are growing now, and their effect upon the subsoil water is remarkable. In addition to this there is a Government scheme, proposed it is said at the instance of Crudeli, for the gradual drainage of the Campagna, which, if carried out, will doubtless produce admirable sanitary results, although the undertaking is a gigantic one.

The prevalence of malarial fevers in England is a matter of

past history; an advanced civilization, extensive drainage, a purer water supply, have combined to sweep away a form of fever which in the days of Sydenham was a veritable plague. It lingers still in some spots, notably in the Isle of Sheppey, and there are few practitioners who do not meet with occasional cases.—*Bristol Med.-Chirurgical Journal, Dec.* 1883, *p.* 143.

2.—ON THE COLD BATH TREATMENT OF ENTERIC FEVER.

By SIDNEY COUPLAND, M.D., F.R.C.P., Physician to the Middlesex Hospital.

The means of reducing excess of body-temperature by cold include, amongst others, affusion, sponging, the compress or ice-bag, and the cold bath. Of affusion (save in connexion with the bath) I have no experience, although I believe that Currie attributed much of his success to the stimulant action of this measure on the torpid nerve-centres in fever. But I will say a few words upon each of the other methods, and their application.

1. *Sponging.*—The face, trunk, and upper limbs are sponged over for a period of ten or fifteen minutes with either tepid or ice-cold water (it is best to commence the treatment with the former) whenever the temperature of the body reaches 102° F. The practice is generally, but not invariably, followed by a fall in temperature, which is not, as a rule, of more than 2° or 3°—a fall the extent of which depends more upon the stage of the fever than anything else. For in the later weeks of an attack the temperature is more labile; the effect produced by sponging is more marked than in the earlier weeks, or when the fever is at its height. And it requires very frequent repetition to be at all effectual in attaining the object of preventing the pyrexia becoming severe. In consequence of this, sponging alone is open to grave objection; for if it be carried out on the strict principle, it involves so frequent a disturbance of the patient that he is deprived of continuous sleep. Moreover, I have met with cases in which, for this reason and for others, the bath has been preferred by the patient. Both methods may be combined in severe cases, the sponging being employed to obviate too frequent recourse to bathing. It has the advantage of not requiring the removal of the patient from his bed, and may be used when bathing is contra-indicated.

2. *The Compress.*—This consists in the application to the surface of the body or of a limb of cloths wrung out in ice-cold water, and it is had recourse to at the same temperature as the sponging, and on much the same grounds. It is also useful in cases of moderate pyrexia; but, like sponging, it does not reduce the temperature to the extent that the bath does. The

compress should be changed very frequently, and its application continued so long as the temperature remains above 99°, so that it requires very constant attention on the part of the nurse. Here, again, the disturbance of the patient interferes somewhat with sleep. I have employed it in a few cases as the sole antipyretic agent, and am convinced of its efficacy. It is especially useful as a substitute for the bath in the later stage of the disease, when there is much abdominal distension. I should add that in all cases of treatment by the application of cold the patient is kept only covered by a sheet and thin coverlet.

3. *The Bath.*—This is undoubtedly the most powerful antipyretic agent we possess, and the only measure that has succeeded in saving life threatened by hyperpyrexia. Even those who mistrust its routine employment in typhoid fever recognise its power, and no one would dispute its efficacy or value as a last resort in such urgent cases. But it is the employment of the bath to control the whole course of the fever that I am considering. Brand's rules are explicit enough; he urges the early commencement of the treatment, and the repetition of the bath every three hours if the temperature rises to 102 2° F. (39° C.) in the axilla, the temperature of the bath not being above 68° F. (20° C.). I have myself so far departed from these rules as to prescribe the bath at a temperature of 103° F., and in several cases it has been necessary to repeat it in three hours, when the fever is at its height. The usual temperature of the bath was 75° F. or 70° F., and its duration ten or fifteen minutes, but both these conditions are varied according to the way in which the patient bears the immersion. In some, especially spare people, the graduated bath—*i.e.*, commencing at 90° F., and cooled to 75° F., with longer immersion, or one at 85° F., is borne better than the colder bath of shorter duration. It often happens that the temperature of the body has risen above 104° F., in spite of hourly observations between the baths, when the next bath is given. Again, in very severe cases, to one of which I shall allude in greater detail presently, hardly any reduction in temperature is effected, or the actual reduction and duration of after-fall is so slight that within a very short time the fever has risen to its previous height. Dr. Ord has recommended the graduated bath, and says that it is most efficient and most safely applied early in enteric fever, but he does not think it necessary to repeat it at shorter intervals than twelve hours, "an apparent revival of the temperature often subsiding after such a period." It may be that the cooler bath acts as a more powerful stimulant on the nerve-centres, more resembles Currie's affusion than the warmer, but in either plan the difference between the temperature of the body and that of the water is great enough to give rise to a considerable

amount of "shock." Shivering is of course an invariable result of the immersion, and sometimes this is so severe as to necessitate the curtailment of the process; I have rarely seen any serious collapse occur, but often consider it advisable to administer a little stimulant. Much of course depends on the mental attitude adopted by the patient; it is not as in hyperpyrexia, where we have to deal with one perhaps semi-comatose; but at a temperature of 103° F. the patient is fully conscious, only wakeful, restless, and uncomfortable. No wonder then that he does not at first like being plunged into water of the temperature of 70° F., and occasionally the dread of the bath is so great as to render it unadvisable to pursue it, when one has to rely upon other antipyretic measures. Those who do submit to the temporary discomfort soon, however, come to appreciate its advantages, and even to look forward to the repetition of the bath, for with hardly an exception the patient afterwards sinks into a calm sleep, and for a few hours at least is in a state of unwonted comfort.

Apart from special contra-indications, the bath has the disadvantage of being difficult of application under all circumstances, an objection which will apply with special force to private practice; but I do not think its employment should be abandoned without an effort, seeing how much it ministers to the well-being of the patient. Again, in hospitals with many fever cases under treatment it would hardly be possible to carry out the routine treatment with the ordinary complement of nurses and attendants, unless some special means were devised to relieve them of the strain and labour involved in lifting adults in and out of a bath. The bath should be large enough to allow of the patient being completely immersed, except the head and shoulders, which may be douched and sponged. After the immersion and removal to bed the body is very lightly dried, and only a light covering placed over the patient, unless there be much shivering, when his feet are wrapped in a blanket. It is not necessary to take the temperature of the body (if so it must of course be a rectal observation) when in the bath or immediately on coming out. It suffices to make the observation half an hour after removal, and repeated at intervals of one or two hours subsequently.

The comparative superiority of the bath to other methods, where these latter have been adopted in preference or as alternatives, is shown in charts. It may be expressed in the statement that the daily mean of the temperature is much lower under bath treatment than under compresses or sponging; for although the maxima may be higher in the one case, the minima are lower.

Once more let me point out that the object of systematic

antipyretic treatment is not to meet the emergency of a hyperpyretic storm, but to safeguard the organism from the effects of continued fever. The mode of action of the methods employed for this purpose may not be the same; it is unlikely, to say the least, that quinine or kairin acts in the same way as sponging or the bath; but it is highly probable that the powerful effects produced by the external application of cold are due as much to the rousing into action of the heat-controlling centres, which are paralysed by the specific virus, as to the mere abstraction of heat. Moreover, the whole effect of the bath may not be merely because it lessens heat expenditure or heat production; it may not be a mere question of diminished body heat; it may also operate upon the central nervous system generally, and be beneficial for other reasons than those of subduing fever only. Certain it is that patients submitted to this treatment pass through their fever more easily, and have fewer of the more serious sequelæ which are liable to occur in cases where no such treatment is adopted.

In estimating the value of any therapeutic measure, we naturally inquire, firstly, what influence it has upon the mortality of the disease, and, secondly, what is its effect upon the course of the disease. The first requires an appeal to statistics. These are open to the objection that it is assumed that in the disease that is analysed the conditions and the rate of mortality are constant, or nearly so. Now this is obviously not the case with the specific fevers, the mortality varying considerably with the type of the epidemic, the hygienic surroundings, and the individual himself. I have placed before you the number of cases of enteric fever admitted into the Middlesex Hospital in every year from 1867 to 1883 (inclusive), with the annual rate of mortality, which has ranged from 28·8 per cent. in 1876 (forty-five cases) to 2·5 per cent. in 1880 (forty cases). The mean mortality for the whole period of seventeen years is 14·8 per cent. of 823 cases admitted, or

In 5 years ending 1871	151 cases	20 deaths	13·2 per cent.
In 4 years ending 1875	165 ,,	28 ,,	16·9 ,,
,, ,, 1879	213 ,,	34 ,,	15·9 ,,
,, ,, 1883	294 ,,	40 ,,	13·6 ,,

From figures given by Dr. Cayley in his lectures, as well as from others I have gathered from hospital reports, we may take it that the mean mortality from this disease in the London hospitals is about 15 to 18 per cent. The rates of mortality in hospitals are no doubt higher than in private practice, among the upper and middle classes, where the care of the patient begins as a rule earlier than in hospitals; for no matter whether the treatment be "expectant" or "antipyretic," the earlier the case is cared for the more hopeful is the outlook. But it is

maintained by Brand and his followers that the rigid adoption of the bath treatment will diminish the mortality to a far greater extent than does treatment upon the expectant plan. I have already mentioned Brand's general statistics, and will content myself with drawing your attention to those figures published by various authorities in Germany, where the adoption of Brand's system is well nigh universal, and where its results have been so favourably regarded that the Imperial Board of Health issued instructions directing it to be carried out in the army.

	Expectant treatment.	Mortality.	Bath treatment.	Mortality.
Brand ..	..8296 cases	21·7 per ct.	...8141 cases	7·4 per ct.
Jürgeson ..	.. 330 ,,	15·4 ,,	.. 160 ,,	3·1 ,,
Liebermeister	..1718 ,,	27·3 ,,	.. — ,,	— ,,
Do.	.. 746 ,,	21·3 ,,	..1163 ,,	11·2 ,,
Do.	.. 61 ,,	23·0 ,,	.. 110 ,,	5·5 ,,
Mosler	— ,,	— ,,	.. 29 ,,	3·5 ,,
Ziemssen and Immermann ..	63 ,,	30·2 ,,	.. 32 ,,	9·4 ,,
Goltdammer ..	— ,,	18·1 ,,	.. — ,,	13·2 ,,
Glenard	— ,,	26·0 ,,	.. — ,,	9·0 ,,
Mayet	— ,,	14·48 ,,	.. — ,,	10·74 ,,

I will now consider more particularly the eighty-nine cases consecutively under my care in the Middlesex Hospital from 1879 to 1883, which include patients of all ages, from three to forty years, fifty-one being males. As may be expected, the cases were of all degrees of severity, and antipyretic treatment of some kind was adopted in the majority of them.

I shall not attempt to present a complete analysis of all these cases, but may refer briefly to the leading symptoms present in the nineteen which were bathed from ten to forty-eight times, these being perhaps the most severe of the whole series; for in all, without exception, the temperature attained 104° at least once, in spite of the controlling measures, and in twelve of them the pulse rate during the height of the fever was 120, while in a few it reached 140. Diarrhœa was marked in ten of the cases; in the rest constipation was more the rule. In one case there was profuse hemorrhage, leading to the abandonment of bathing after twenty-four baths had been given; and this patient, a woman thirty-three years old, recovered. There was slight hemorrhage noted in three other cases, in one shortly after admission, and before any baths were had recourse to. In most of the cases there were bronchitic signs; but the bronchitis could only be said to be severe in three, in which there were also signs of hypostatic congestion, and, except in one case, in which the fever could not be thoroughly controlled, the pulmonary condition did not notably increase under the

treatment. Occasional transient and mild delirium occurred in seven of the cases; it was severe, and accompanied by insomnia and tremors in the case just referred to as resisting the antipyretic effect of the bath. In one case there was slight albuminuria. Four cases relapsed, but in most the duration of the fever was prolonged, the average stay in hospital of the seventeen cases that recurred being eight weeks. Yet sequelæ were few—viz., periostitis in one, axillary abscess in another, and bedsores in a third.

I can best illustrate the practice by briefly relating the particulars of two cases. I select these cases, because in the one the bath treatment was actively employed from the first, and in the other it was used in a relapse. The subject of the first case was a thin delicate lad, twelve years old, admitted on Nov. 8th, 1880. He was liable to attacks of bronchitis, and his illness, which commenced with headache, muscular pain, debility, cough, and later diarrhœa, had lasted about a week before his admission. His aspect was depressed, skin dry, but no rose-spots could be seen; the temperature was 102°. The belly was tympanitic, and the "tache" was readily elicited. Marked bronchitic rhonchi, but no dulness at bases of lungs; respiration 30; pulse weak (120); heart sounds feeble, and cardiac impulse very readily visible through the thin parietes. No increase in the normal area of splenic and hepatic dulness. At 7 p.m. on the day of admission the temperature rose to 104·4°, and he was placed in a bath of 70° for ten minutes, which reduced the temperature to 99·6°. The bath was repeated at 10 p.m., the temperature having risen to 103·8°, and a dose of quinine (ten grains) was given afterwards. The next day, the ninth of his illness, the temperature only once rose above 103°—viz., at 7 p.m., when a third bath was given, but with less effect, for in eight hours the temperature was again 103·8°, and a fourth bath was given. During this day, the tenth, the temperature rose very rapidly, and no fewer than seven baths were given, the effect of each being to reduce the temperature from nearly 104° to 100° or 101°. A dose of quinine was prescribed after the last bath given at midnight. During the eleventh day he had four baths given at varying intervals, only one being required in the forenoon, showing apparently the value of the quinine in controlling the pyrexia; the maximum temperature on this day was 103·4°. On the twelfth day he had one bath in the forenoon, and three from 3 p.m. to 9 p.m., the temperature having risen rapidly on each occasion to 104·4°, 104·8°, and 104·2° respectively. On the thirteenth day six baths were given at about regular intervals, the temperature only occasionally mounting up to 104° by the time the bath was prepared. On the fourteenth day the fever was at its height,

for in spite of watchfulness it attained 104·8° and 105·2° on two occasions; seven baths were given on this day. On the fifteenth day, four baths were given, all afternoon, the temperature not reaching above 103·6°. On the sixteenth day six baths were given until 3.30 p.m., when, owing to the motions being tinged with blood, this treatment was suspended, and cold sponging practised at intervals during this day and the following. The signs of hemorrhage not being repeated, and the sponging proving ineffectual to control the pyrexia to any marked extent, three baths were given on the eighteenth day after 6 p.m., and the last, or forty-eighth bath, was given at 3 p.m. on the nineteenth day, from which time the temperature never rose again to 103°. For some days there were considerable fluctuations in temperature — as much as three or four degrees between the morning and evening records; but a week later — namely, on the twenty-fourth day — a normal temperature both morning and evening indicated that defervescence had occurred. A week later there was a slight and transient recurrence of pyrexia, but no true relapse. The case was a severe one; for although the diarrhœa was not marked, only about one or two loose motions daily, and on one occasion only any sign of hemorrhage, yet there was considerable tympanites, and very marked bronchitis, which was not influenced either for good or ill by the immersions. The main anxiety lay rather in the indications of the pulse, which was throughout feeble, and its rate on the thirteenth day as high as 156; so that alcohol was not sparingly given. But a notable feature was the entire absence of delirium, and the fact that he slept well in the intervals of the bathing. He took nutriment well, but convalescence was rather slow, the emaciation and debility being very marked. His stay in hospital, about seven weeks, was not, however, so prolonged as in many cases.

The other case I have selected is that of a bricklayer, twenty-six years old, admitted on July 12th, 1881, in the second week of his illness, his previous health having been good and his habits temperate. He was a well built muscular man, but very prostrate on admission. Abundant rose rash; no distension of belly; no evidence of splenic enlargement. Temperature 102°; pulse 120; respiration 24. He had a short cough, with muco-purulent expectoration; and physical examination revealed abundant rhonchi over the chest; weak breathing at the bases of lungs. At 6 p.m., the temperature being 103°, sponging was prescribed, and was repeated whenever the temperature rose to 103°, which it did repeatedly during the night. On the next day (about the thirteenth of his illness) the temperature was 104·2° at noon, and he passed blood in the motions. Quinine

was given—twenty grains in two doses—but it excited vomiting, and the hemorrhage recurred, but at no time after this. From the fifteenth to the twentieth day the pyrexia was mild; maximum temperature about 106°, with normal temperatures in the morning. The bronchitis, however, persisted, and the patient's debility and loss of flesh increased. On the twenty-fifth day a recrudescence (if not a true relapse) of the fever occurred, the temperature rising to 102°, and on the twenty-sixth day to 103·6°, when quinine was given. He complained of abdominal pain, but there was no diarrhœa. From the twenty-sixth to the thirtieth day the temperature was frequently above 102°, quinine being given in ten-grain doses at intervals without much appreciable effect. At 3 p.m., on the thirtieth day, the temperature being 103·8°, he was placed in a bath of 78° for fifteen minutes; this reduced the temperature to 99° (half an hour after removal from the bath), but it rose again to 103° in six hours, and the bath was repeated. On the thirty-first day he had two baths, on the thirty-second five baths, on the thirty-third two baths, on the thirty-fourth four, on the thirty-fifth two, and on the thirty-sixth one, the temperature often being 104°, and once 105°—*i.e.*, eighteen baths in seven days. This relapse, if it may be so-called, was also characterised by an abundant crop of rose spots, by slight diarrhœa, by the spleen becoming palpable, by great depression, by the tongue being dry and brown, and by the persistence of marked bronchitic signs. The pulse rate rose from 100 to 144 on the thirty-fifth day, and the cardiac sounds became very feeble. On August 9th—*i.e.*, about the fortieth day—the temperatures were normal in morning and evening, and the bronchitis had nearly disappeared. He had only just entered upon convalescence and was still very feeble, when he insisted on leaving the hospital on August 18th.

These cases will suffice to indicate the line of practice—viz., to employ the bath as an antipyretic agent, and to continue its use without intermission, unless in the presence of some contra-indication as the occurrence of intestinal hemorrhage, so long as the temperature rose above 103°, severe bronchitis notwithstanding. It will be seen that the temperature of the body often exceeded this limit when a bath was given, but this merely means that in the hour or two hours that elapsed between one thermometric observation and another, the temperature had passed from below 103° to above it; and I do not think it would have been advisable in any case to give more baths within the twenty-four hours than was given on some of the days in the first case. Nor were these cases treated with the rigor prescribed by Brand, not only as regards the temperature at which they were bathed, but as regards the tem-

perature of the bath; and in the second case it is quite possible that the severity of the relapse owed something to the lack of rigid antipyretic measures in the primary attack. Nor was the feeble circulation allowed to interfere with the adoption of the treatment, although necessarily forming an anxious element in the cases. Lastly, the value of the antipyretic measures in preventing cerebral symptoms was well shown.

What are the good effects that may be expected from the steady pursuit of these measures? I think they are mainly these:—If commenced early enough, and carried out systematically, it may curtail the disease by rendering it abortive; but that as it is practically impossible either to be certain of the nature of a pyrexia at its inception, and therefore to commence antipyretic measures so soon as might be desired, it may be conceded that if it do not exert any control over the progress of the intestinal lesions it does appreciably diminish the dangers to life due to pyrexia itself, and place the patient in a better condition. For under antipyretic treatment nervous symptoms are allayed, sleep favoured, delirium banished or much reduced. The prostration is less, the so-called "typhoid" state is mostly conspicuous by its absence. The pulse gains in force, and the tendency to pulmonary congestion and collapse of lung, which endangers life in the early weeks of every severe case of enteric fever, is obviated. Further, the digestive and assimilative functions are improved, so that the difficulty is to avoid yielding to the patient's desire for a solid diet, before defervescence has occurred; and, at the close, the patient's mental and physical vigour is far more speedily restored, and such sequelæ as mania and other conditions indicative of profound nutritional disorder of the nervous system rarely occur. It does not appear to increase the liability to intestinal hemorrhage or to perforation, which depend on the severity of the local lesions, And it reduces the mortality from the disease.

As to the rules, so far as it is possible to formulate any, of the treatment, they may be summed up as follows:—The patient should be as lightly covered as possible, and whenever the temperature reaches 102° sponging should be practised; but if, as mostly happens, the pyrexia cannot be adequately controlled by this measure, then the bath-treatment may at once be commenced. The temperature of the bath may be about 75°, and the time of immersion ten minutes; but this may be varied, as already explained. If possible the bodily temperature should not be suffered to rise above 103° without having recourse to the bath; and if this entail the repetition of the bath more than every three hours sponging may be practised in the intervals, or quinine given after a bath. The

treatment must not be abandoned, in the face of pulmonary complications, as bronchitis, congestion or pneumonia; but when necessity compels a resort to it in the later stages of the fever, and symptoms of grave intestinal lesion are present, caution should be practised in bathing, for which it is well often to substitute the application of compresses or cold sponging. If there be intestinal hemorrhage or signs of peritonitis, the bath must not be given. Although by aid of stimulants bathing may safely be practised when the pulse is rapid and feeble I should regard extreme debility, especially in old subjects, or the presence of organic heart disease, as distinct contra-indications for its employment. It is not prudent to relax rigid dietetic rules, although the patient, under the influence of the treatment, may have his digestive functions so improved as to create a craving for solids before actual defervescence sets in.

To pursue the antipyretic treatment of enteric fever so thoroughly as to attain the desired ends requires much attention and close watchfulness on the part of those in charge of the case; and although in many cases it may seem afterwards as if the resort to such measures had been unnecessary, so far as the recovery of the patient is concerned, the gain derived from increase in comfort, and deliverance from the dangers, direct or remote, of continued pyrexia, is surely worth all the labour and care that may have been expended.—*Lancet, Feb.* 23, *and March* 1, 1884, *pp.* 333, 378.

3.—ON THE COLD BATH TREATMENT OF ENTERIC FEVER. By J. S. Bristowe, M.D., Physician to St. Thomas's Hospital.

My personal experience in the treatment of enteric fever by the cold bath is not extensive, and for some years past I have rarely, if ever, had recourse to it. I have undoubtedly seen patients apparently benefited by it, undoubtedly benefited at the time, and making later a good recovery. But I have never felt perfectly satisfied in those cases that I have carefully watched that the benefit to the patient was real, or that his recovery was determined or hastened by it. But I had two cases, occurring within a short time of one another, which impressed me strongly, and the results of which were the main cause of my giving up the habitual practice of the treatment. I have not had time to search for the notes of these cases, but I have no difficulty in recalling the main features of them. The first was that of a young man who had a very severe attack of enteric fever, who had had much diarrhœa, a little pulmonary complication, and in the second or third week was in the typhoid state, with a temperature reaching at least

105°. A few days before his death the cold bath treatment was adopted *secundem artem*, and at first with a little apparent benefit. Then he almost suddenly fell into collapse, with livid surface, rapid, shallow breathing, and distension of the abdomen. It was thought that he had perforation of the bowel. At the post-mortem examination all the usual lesions of enteric fever were present, with very extensive ulceration of the bowel, but there was no perforation, and no sign whatever of peritonitis. The lungs, however, were in a condition which I never recollected to have seen before in enteric fever. They were small, slate-coloured, and almost empty of air throughout. They were in a state of universal collapse, without any trace of actual pneumonic consolidation. I could not help regarding the condition of the lungs as a consequence of the repeated application of external cold. A few weeks after this I had another case of enteric fever of about the same standing, and equally ill, and the question arose of using cold baths; recollecting the other case I decided not to employ them. A few days later the patient died, and I was present at the autopsy. The bowels were much ulcerated, but there was no perforation and no peritonitis. The lungs were exactly like those in the former case, and I at once remarked, "Well now, if this patient had been treated as the other was, by cold baths, I should have attributed his death to them; as it is, my explanation of death in the other case needs correction." The resident assistant physician, however, who was present, then informed me that after my visit the cold bath treatment had been had recourse to. I have little doubt that my explanation of the condition of these patients' lungs was correct, and that the immediate cause of death in both cases was the lung affection. Of course I do not mean to say that they would have recovered even if the baths had not been given to them.

I have recently been speaking on this subject to a young Austrian physician who has been for several weeks past in London, and he tells me that at some large hospital in Austria—I am not sure whether it is at Vienna—the use of cold baths, which were formerly largely in vogue, has been discontinued owing to the heavy mortality and to the frequent occurrence of intestinal hemorrhage among the patients thus treated. I should be interested to know what is the experience of other practitioners in London as regards the occurrence of congestion and collapse of the lungs, and congestion and hemorrhage of the bowels as a consequence of cold bathing.

When any plan of treating disease is introduced on high authority, it is usually largely adopted, and finds many en-

thusiastic advocates. There is one reason no doubt why the cold bath treatment should be an exception to the rule—namely, that it is difficult and expensive of application. Nevertheless I believe that it has been very largely adopted abroad, and even to no inconsiderable extent in our own country and in this metropolis. It was once much employed at St. Thomas's. Some of my colleagues were much more enamoured of it than myself, and some at any rate have written strongly in its favour, but for several years its use has only been exceptional. My impression is that it has been largely discontinued in most of the hospitals of London. The German gentleman whom I just now quoted assures me that its employment has almost died out in Austria, and some other parts of the Continent; and that even in Prussia it is scarcely in use, excepting by two or three enthusiasts who have identified themselves and their reputation with it.

If the view above expressed of the liability of the cold bath treatment to induce dangerous internal complications, and if its large discontinuance by those who formerly employed it be correct, they present strong arguments against its value as a curative agent.—*Lancet, March* 1, 1884, *p.* 382.

4.—ON THE TREATMENT OF FEVER BY COLD AFFUSION.

By JOHN HADDON, M.D.

Individual opinion as to any method of treatment founded on experience must be taken for what it is worth, but believing that the use of an agent such as cold water, so powerful for good or evil, in the treatment of febrile diseases, is a subject well worthy of study, I venture to relate my experience and the conclusions at which I have arrived. In 1869 I began, in general practice, to use cold baths in the treatment of typhoid fever, in full faith, judging from what had been written on the subject, that it was the best treatment I could adopt. I found that the treatment could be carried out with little difficulty, but the results were disappointing. The temperature could, indeed, be reduced by the bath, but it returned to its former height with, in some cases, the most disheartening rapidity; and failing to observe the great advantages claimed for the treatment, while its disadvantages were very apparent, I gave it up.

Besides the bath, I tried sponging, packing, and the use of india-rubber tubing, so arranged as to cover a considerable surface of the trunk, while a continuous stream of cold water was passing through it. I observed no benefit from the tube or sponging, but was satisfied that the cold wet pack was of use in many acute febrile diseases, although a pack did not reduce the temperature more than a single degree. The shock given

to the patient by the wet sheet appeared to be as great as being put into the bath, and though it made very little difference to the temperature of the patient, improvement in other respects could be observed, more especially on the pulse, on the intellect, and in being followed by sleep. Accordingly, the pack became the only way in which I used cold water in the treatment of pyrexia. In hyperpyrexia, however, I still adhered to the bath; but having witnessed the effect of a cold douche in such a case, I lost faith in the bath even in that state. The case was as follows:—I was sent for hurriedly to see, for the first time, a case of typhoid fever well on in its course—I found the patient unconscious, in a sort of convulsive tremor, with a temperature of 108°. Seeing that death was imminent, and believing that a cold bath would give him the only chance of life, I carried him to the bath-room. The bath was empty, but I laid him in and turned on the cold tap. Fearing that life might ebb before sufficient water could surround his body to make any difference to his temperature, I dashed cold water on his chest out of a tumbler. The first douche made him look up with intelligence, and his symptoms had greatly improved before there was any quantity of water in the bath. Struck with the sudden improvement which the cold douche produced in this case, and having heard of Dr. Currie's treatment, I obtained his work on the treatment of fever by cold affusion. From its perusal I determined to adopt his practice; and the first case in which I had occasion to try it was that of a boy, to whom I was called early in the morning of the second day of scarlet fever. He had a livid rash, and was almost unconscious, with a pulse that could hardly be felt. Having stripped him naked, I set him into an empty tub, and poured a pailful of cold water over his shoulders. Though he was helpless enough when set into the tub, he got out without help, and was put into bed among blankets. To my astonishment, his pulse immediately after the water had been used, was full and about 120, and he was quite intelligent. His skin became moist, and he slept. The sudden change in the pulse and the intellect astonished me, but the perspiration, in such a case of scarlet fever, on the second day of its course, was to me the most remarkable of the effects of a single cold affusion. The temperature was reduced only one degree. The boy asked to have the affusion repeated, and his mother continued the treatment herself. For this treatment nothing is required except a tub and a pail of water, and I found adults in typhoid fever as fond of the treatment as was the scarlet fever boy. The effect of cold affusion in fever convinced me that the temperature is by no means the most important symptom in fevers, and I was confirmed in this belief by the record of the case of a young lady who, from some spinal

injury, had a continuous temperature of 122°, without any disturbance of the digestive or other organs, showing, in fact, none of those symptoms for which the pyrexial state has been blamed.

Such is the story of a conversion from the belief that the pyrexia is the chief danger in typhoid fever, and that the cold bath is the proper treatment, to the conviction that pyrexia though, as a rule, a good index of the severity of a fever, is of itself by no means so dangerous a symptom as is generally believed. It is not easy to divest one's self of a long cherished belief, and it is proverbially difficult to strive against the current. Nevertheless, truth will prevail. There are some in the profession who venture to express their disapproval of the systematic use of cold baths in typhoid fever. At the British Medical meeting in the Isle of Wight, in 1881, I read a paper in which I endeavoured to prove that antipyretic treatment was unjustifiable; and during the discussion which has just taken place at a meeting of the Medical Society of London, two members, Dr. Samuel West and Dr. Maclagan, ventured to question the truth of the statement that a high temperature was of itself dangerous. It is possible that my conclusions may be erroneous; nevertheless, when we look at both sides of the question, I think it will be admitted that they are not without some show of reason.

Those who advocate thorough antipyretic treatment in typhoid fever, or any other disease, would require to prove, 1st, that the pyrexia is the chief source of danger; and, 2ndly, that by keeping it within proper limits by the use of the cold bath the patient's chances of recovery are increased.

First, then, has it been proved that the pyrexia is the chief source of danger? So far as I am aware no attempt has been made to prove such a statement. It is a pure assumption, without one single fact to support it; and yet, owing to its frequent repetition by those who are recognised as authorities, the bulk of the profession has come to believe that it is true, while our teachers and text-books do not fail to give effect to the general belief. Secondly, does it increase the patient's chance of recovery? Those who advocate this treatment prove by mortality statistics that it does; but statistics are not to be relied on in proof of such a statement. Take the case of pneumonia, which was the battlefield of our fathers, as typhoid fever is ours. Would it be correct to say that the expectant treatment of Bennett was the right treatment of pneumonia, because the mortality under it was so much less than it had been under the antiphlogistic remedies which were previously employed? Surely not. Some treatment may yet be found

which will do more for a pneumonic lung than mere expectancy; but we would be justified in saying that the antiphlogistic treatment was worse than the expectant method, and that by giving up the lancet and its adjuvants patients had a better chance of recovery. Now, the case may be analogous with regard to the treatment of typhoid fever. Before antipyretic treatment was adopted drugs were mostly relied upon, while, when this treatment was adopted, drugs were to a large extent discontinued, and so, perhaps, the patients would have a better chance of preserving their digestive tract unimpaired, and consequently would have more strength to oppose the ravages of the fever process.

Whether or not this may account for a lessened mortality under antipyretic treatment, which we may grant for the sake of argument that statistics have proved, there is another question that is worthy of consideration.

We may presume that putting a patient suddenly into cold water will have the same effect as putting the cold water suddenly on him. I have shown how beneficial cold affusion is, and I believe hot affusion would have exactly the same effect, judging from their almost identical effect on a healthy person. Is it not possible, nay very probable, that the good effect of a cold bath is in the sudden shock which immersion gives to the system, and that the bad effect is produced by the continued immersion? This seems a question well worthy of being inquired into, and, if found to be true, then we would do well to return to the practice of cold affusion in the treatment of fevers, as advocated by Dr. Currie, in Liverpool, and used with success by Edinburgh physicians at the beginning of this century.

As to antipyretic drugs, if the pyrexia is not a dangerous symptom in fevers then their use must be abandoned, for though we know they reduce the temperature, we don't know what else they may do, but we have good grounds to suspect that they may not be without some prejudicial influence on the system.

Those who have studied the pulse by the aid of the sphygmograph in fevers, must have seen how quickly the character of the tracing changes, and been struck with its value in prognosis; and there can be little doubt that in paying so much attention to the temperature, to the neglect of the pulse and other symptoms, we are not likely to advance our knowledge of the febrile process, or guide our patients to recovery so well as we might otherwise do.—*Edinburgh Medical Journal, April* 1884, *p.* 919.

5.—ON SCARLET FEVER: HOW TO LIMIT ITS CONTAGIOUSNESS.

By W. ALLAN JAMIESON, M.D., F.R.C.P., Lecturer on Diseases of the Skin, Edinburgh School of Medicine.

When once minute infective particles have become diffused in the air which surrounds the sick person we have no further control over them. We have no available means of disinfecting the atmosphere while the patient is in the same apartment. Those substances which might possess the power of neutralizing the contagion in the air are incompatible with life, and, if employed in a strength sufficient to exercise control over the infective material, would prove fatal to every living being within their range. Thus all agents employed to disinfect the air of rooms which are at the time occupied are, to say the least of it, harmful. If they are possessed of odour, they mask the closeness of the air and the consequent necessity for ventilation. If they have no smell, they are objectionable as tending to foster feelings of false security.

When an individual contracts scarlet fever, when he catches its infection, the first symptoms are manifested in the throat; the second, within a few hours after, in the eruption on the skin. Now, though we cannot disinfect the air which surrounds him, we can, by the employment of suitable antiseptics, disinfect his throat, and thus prevent the infectious particles from being taken up by the breath which he expires from his lungs. We can in the same way disinfect his skin, and thus render the scales thrown off in the process of peeling, which takes place during his recovery, innocuous. We can thus prevent the air of the chamber in which he lies from ever becoming charged with the floating poison, which is much better than were we to endeavour to destroy this poison after it has become diffused in the atmosphere. The latter method is certainly a very round-about one. In general, the clothes, the bedding, all he had touched, all round about him during his illness, have been carefully fumigated, and otherwise cleaned, purified, and destroyed, *after he became well;* but too often the patient himself, the source of all the danger, has been forgotten, as far as employing precautionary measures for the protection of his attendants and others from the commencement of his illness and through the whole course of his complaint.

What, then, can be done in this respect? The development of the eruption should be promoted by warm baths, and the congested skin should be soothed and kept soft and pliant by their means throughout. Warm baths should be used *from the very first.* There is quite a consensus of opinion that it is a symptom of good omen when the rash appears freely, and its

evolution is facilitated by a hot mustard bath. Afterwards a simple warm bath, at a temperature of from 95° to 98°, should be employed nightly. The patient may recline in a hip bath and have the water laved over him, or be laid out at length in a long narrow bath, with the head supported. This latter plan obviates the chance of faintness or giddiness, sensations which are sometimes complained of. When the skin has been rapidly dried, the sick person should be at once replaced in bed, and the whole body and limbs, and the head, which has not been wetted, are to be anointed with a medicated ointment, which should be gently smeared over the surface. This prolongs the cooling effect of the bath; and while, by its oiliness, it lessens the production of the dry scales, it renders at the same time those which are cast off harmless. The use of an antiseptic ointment during the stage of desquamation is nothing new; but its employment from the very first, in conjunction with warm baths, so as to anticipate the development of the infectiousness of the scales, has not, I believe, been previously advocated. That which I have found best suited for the purpose is one composed of thirty grains of carbolic acid, ten grains of thymol, one drachm of vaseline, and as much simple ointment as will make the whole up to an ounce. The thymol should be dissolved by the aid of heat, as its crystals are apt otherwise to irritate the skin. So prepared, the odour is not unpleasant, while it retains its greasiness for a considerable time after being applied. It should be smeared on in the morning as well as at night, after the bath. When the patient is well enough, one or two thorough washings with carbolic acid soap, in which process the hair and head should be included, will remove any lurking trace of infection.

For the throat we now possess a remedy thoroughly efficient and at the same time safe. The whole of the back and sides of the throat and tonsils should be brushed three or four times a day with a saturated solution of Barff's boroglyceride in glycerine. This is at least three times as strong as a saturated solution of boracic acid in glycerine. When painted on the inflamed throat it causes no pain, and the taste is not complained of even by young children. The inside of the nostrils may be similarly treated if there is any nasal catarrh.

All bed and body linen, handkerchiefs, and everything which can be washed, which the patient has used, should be put into a tub containing one large tablespoonful of carbolic acid dissolved in the water with which it is filled, so soon as they are removed from his person. In this way they can be carried from the room without any risk of their spreading the disease to others, and washed by any one without danger.—*Edinburgh Medical Journal, March* 1884, p. 787.

6.—ON DISINFECTION BY HEAT.

By JAMES ADAMS, M.D., Glasgow.

To Dr. W. Henry of Manchester is due the merit of conceiving and demonstrating by actual trials the fact that heat destroys or neutralises the morbific matter of certain communicable diseases. In 1832 (*Phil. Mag.*, vols. X, XI), he published the results of experiments, showing that cow-pock matter becomes totally inert after exposure *for some hours* to a temperature of 140° F.; and that clothing designedly infected with scarlatina and typhus *contagium* was afterwards worn with no bad results by individuals likely to be susceptible, such clothing having previously been confined *for some hours* in a temperature of 200° to 206° F.

Since the time of Dr. Henry, various methods have been employed for practically utilising his richly suggestive conception, but in some instances without observance of his precautions, of which more hereafter. Meanwhile, a short reference to the nature and properties of the matter that transmits contagious disease will aid my description of a new disinfecting chamber, professing to have some important distinctive features.

Of the constitution of morbid poisons we are as ignorant as of that of prussic acid or of strychnine; nor is it probable that the knowledge, if we possessed it, would throw any light on their mode of action, so far as relates to the essential morbific principle. We are well acquainted with their *chemical composition* without in any way understanding how they act so powerfully on the animal system. But we know they are capable of being decomposed by weak chemical agents, and rendered inert by temperatures of about 200° F., and therefore that their constitution is not stable, and that they are held together by very feeble affinities.

That contagion is connected with the diffusion of organisms possessing vitality may now be assumed as an established axiom. This doctrine, known as the "Germ Theory," is usually ascribed to Pasteur, and it is undeniable that he is entitled to pre-eminence in enunciating the truths on which the doctrine is now so soundly based. But the notion was held as far back as 200 years ago, and originated with Kircher, who advanced the view that *animalculi* or *acari*, diffused through the atmosphere, were the true originating causes of epidemic and contagious diseases. His opinion was endorsed by Linnæus and advocated by other eminent men, but did not meet acceptance among physicians. On the contrary, it was by them, until a recent date, held that there existed a deleterious principle or medium, vaguely expressed by such terms as "fomites,"

"virus," "effluvium," &c., which became contagious or epidemic by some occult and mysterious influence, some "corruption of air," or some spontaneous change in inanimate matter. And it is illustrative of the general notions that long prevailed, and at the same time interesting in the present connection to note that Dr. Henry, who devoted much consideration to the problem, and whose name is so honourably associated with the subject of disinfection, was a strong disbeliever of Kircher's hypothesis, and characterised it as singularly unsound—as having not a single valid analogy to confirm it—and as being at variance with all that is known of the diffusion of volatile contagion.

So late as 1860, the mysterious *something* that originated epidemic and contagious disease was a matter of keen controversy, and was generally believed to have its most probable solution in establishing or disproving the doctrine of spontaneous generation, regarding which the views of the illustrious Liebig were held open to refutation by his no less illustrious contemporary, Pasteur. The continuous and untiring researches of Pasteur, aided by others, and at a later date very materially by those of his able expositor, Tyndall, have clearly demonstrated not only the fact of the generation of certain communicable diseases by living organisms or "germs," but have gone far to make it very probable that it is through living organisms or germs that all zymotic diseases are propagated. According to this doctrine, putrefaction and epidemic disease alike, arise, not from the air, but from something contained in the air. This something is not a vapour nor a gas, nor a molecule of any kind, but a *particle*, or bit of liquid, or solid matter, formed by the aggregation of atoms or molecules. Tyndall has shown that the air is at all times, even when free from microscopically visible particles, beset with much smaller ultra-microscopical particles, and he alleges that air from which the particles have subsided—air which is "optically pure," as determined by the electric beam—is no longer capable of contaminating liquids, or of inducing fermentation or putrefaction. From such facts, and from a review of the whole field traversed by other observers, he concludes that these particles are organisms, the germs of septic bacteria. "The thing, he says, "which we vaguely call a 'virus,' is, to all intents and purposes, a seed. As surely as a thistle rises from a thistle seed, as surely as the fig comes from the fig, the grape from the grape, the thorn from the thorn, so surely does the typhoid virus increase and multiply into typhoid fever, the scarlatina virus into scarlatina, the small-pox virus into small-pox."

This "virus," these particles or germs, are *volatile*—are shed

freely from infected individuals and from their clothing, and are wafted to and fro by aerial currents. Hence, all appliances which have for their object to limit the spread and ensure the destruction of these germs should be planned with special provision for this dangerous property of volatility in the germs of disease.

While the hypothesis of spontaneous generation was in dependence and under anxious discussion throughout the scientific world, heat was the chief agent employed to determine the actual vitality of microscopic forms that are developed so abundantly in infusions of organic matter, and even in saline solutions. And while there was a general *consensus* to the effect that heat destroyed the evidence of vitality drawn from active movements, there was a great conflict as to the *degree* and *duration* of heat required. Moreover, there was a renewed generation of the same forms frequently observed in the liquids supposed to have been sterilised, which naturally gave rise to the belief in spontaneous generation. The first light thrown on this perplexing riddle was by Prof. Cohn of Breslau, who showed that confusion and contradiction had arisen from having failed to distinguish *the growing germ* from its seed or spores. And it was reserved for Prof. Tyndall to pulverise and destroy for ever the doctrine of spontaneous generation, by an exhaustive series of brilliantly conceived and thoroughly conclusive experiments. He showed that the vitality of a germ or embryo organism and its disposition to development was a latent property dependent on different conditions of species, age, desiccation, exposure to air and light, &c., and that, subject to these varying conditions, there were required varying periods for germination; that in the operation of boiling which was usually adopted for their destruction, the broods or crops may overlap each other, the new brood making its appearance before the old brood died away, and that by repeated boilings at short intervals, and not by prolonged boiling, dealing with each successive crop as it springs into active life, there was effected ultimately a complete destruction. Finally, he showed how all preceding observers had failed in their best intended efforts to procure a condition of the air absolutely, or, as he phrases it, "optically pure;" and with this necessary condition of purity secured he predicted with an accuracy that has not since been gainsaid, that there never would again occur an example of so-called spontaneous generation.

The distinction to be observed between the seed itself and the developing organism cannot therefore be too strongly impressed on the mind when dealing with methods of germi-

cide. Notoriously the growing or adult organism can be easily destroyed. Not so the seed. The contrasted difficulty has been well expressed by our senior city member, Dr. Cameron, in his very instructive, and in every respect excellent monograph on "Microbes." Dr. Cameron says—"As to the spores which they (*i.e.*, the developing or adult organisms) produce, and from which succeeding generations spring, there is almost no killing them. The more you dry them the better they resist destruction. Time is no object with them, and they maintain their dormant vitality for an indefinite number of years. Absolute alcohol has no effect on them. As to oxygen they can stand that concentrated by the pressure of twenty atmospheres, and be none the worse. Two or three hours' boiling, if they have been well dried beforehand, seems not to hurt them, and they have even been known to resist eight hours of the process. *The only effective means for their immediate destruction that I am aware of is the flame of a spirit lamp.* To that their extreme minuteness renders them an easy prey."

But Pasteur never saw germs resist 230° F., or the adult organism from 128° to 140° F., *when in the moist state.* Chauveau, Calvert, Roberts, Tyndall, and many others have shown that from 140° to 212° F. is a degree of heat that few developed germs can sustain. According to the very recent experiments of Koch, Wolffhügel, Gaffky, and Læfleur, exposure to temperatures of 212° to 221° F. in dry heated air effects easily the destruction of bacilli and "adult" bacteria; while *spores* of mould were not killed after being subjected for an hour and a half to air heated from 230° to 240° F., and *spores* of bacilli were destroyed only after being confined for three hours in an atmosphere of 284° F. On the other hand, these last named observers have given very important evidence as to the difference in effect of heat, according as it is dry or humid, for they found that spores of garden earth and of carbuncular disease lost all vitality by an exposure, of only ten minutes, in hot vapour registering 230° F., and they assume that this is the temperature to which ought to be heated any morbific principle of an unknown nature which can transmit disease. Their experiments show that in a practical point of view one cannot have absolute confidence in dry heat for the disinfection of all suspected objects. On the whole, it may be affirmed that duration of heat and its degree are mutually complementary both with dry and with moist heat, a long exposure to a low degree being equivalent to a shorter exposure to a high degree.

The natural inference from such experiences is, that in seeking to disinfect by heat, that heat should be carried as high,

and continued as long as is possible, or necessary, to ensure the destruction of infective matter; subject only to the limit that infected clothing or other articles operated upon may not be injured or destroyed. And in determining the practical limit that is expedient, I have again to make honourable mention of Dr. W. Henry, who made practical trials 50 years ago on fabrics of clothing and other articles, which have left little save gleanings for subsequent observers. For the experiments of Ransom, Chaumont, Vallin, Koch, Wolffhügel, and others, have added little beyond a confirmation of Dr. Henry's conclusions, and to these later observations I need not therefore refer in detail. They show in summary that exposure in dry heated air to a temperature of 220° to 230° for one or two hours is sufficient for disinfecting purposes, does not injure the integrity or the appearance of ordinary clothing and bedding, but that a temperature of 250° is risky, may cause injury, and is therefore unnecessary.

In considering the practical application of heat to infective matter for disinfecting purposes we need not take into account the exceptional laboratory experiences of various observers who have recorded extraordinary degrees of heat withstood by some germs. These are little likely to be noticed in future now that Tyndall has specified so clearly the conditions under which they are likely to have occurred. These rare instances are matters of curious interest, more for the naturalist than for the sanitary physician. The general evidence now accumulated is abundantly sufficient to warrant the conclusions recently laid down by Pasteur and Leon Colin in their report on disinfecting stoves made in 1880 to the Council of Health of Paris and the Seine. These are to the effect that while humid heat of 212° F. will certainly destroy all life in morbid germs, and all dangerous condition in virulent matter, a temperature between 212° and 230° F., whether dry or humid, may be fixed as sufficient for all practical purposes. A higher temperature is unnecessary.

[Dr. Adams describes and gives a diagram section of a new "Disinfecting Chamber" which he has devised.]

Disinfecting by heat in a chamber which confines all volatile matter until the close of the operation, is carried out in various apparatus in frequent use. Dr. Esse, of Berlin, who has given much attention to the subject, makes this the principle of several chambers constructed under his direction, at the Hospital at Moabit. In one arrangement the infected articles are placed within a cylinder which is itself contained within a larger cylinder, the space between being filled with steam, and thus the inner cylinder is heated. There is no communication between the outer and inner cylinder, and the latter contains dry heat only. This is precisely the arrangement, on a

larger scale, devised by Dr. Henry in his small laboratory apparatus 50 years ago. In another form Dr. Esse's chamber is lined or traversed with steam pipes. M. Vallin, in his comprehensive treatise on Disinfection, objects to Dr. Esse's chamber that the air is stagnant and cannot have the heat penetrating property of hot air in motion. He suggests—and the suggestion is applicable to other apparatus—that at a stage of the operation a stopcock should be opened admitting a jet of vapour for 15 to 45 minutes, having a temperature of about 212° F.; this vapour to be afterwards got rid of by ventilating openings, and the operation completed by dry heated air, so as to thoroughly dry the infected articles. He believes such an arrangement to be perfect. I think it will be evident that in my chamber the process that M. Vallin recommends is practically ensured with this superadded advantage, that ultimately all air or vapour that has been in contact with the infected matter is made to pass through a furnace.

Mr. W. Lyon, a London manufacturer, supplies a machine that confines all volatile *contagium* till the close of a disinfecting process, and also aims at carrying out the "principle" of moist heat; and it professes likewise to introduce an entirely novel "principle" of action peculiar to itself, of which moist heat is the characteristic, which I believe to be a fallacy.

In conclusion and on a careful consideration of the entire subject of disinfection by Heat, I feel warranted in laying down the following axioms, of which the first is a truism.

1. That as contagious matter, volatilised and diffused in the atmosphere, is the chief condition that propagates contagious disease, it follows that the best preventative consists in excluding the entrance into the atmosphere of such contagious matter.

2. That any apparatus for disinfecting by heat is insufficient that does not make provision for detaining volatile contagious matter, and subjecting it to the same degree of heat, at least, and the same duration of exposure that is found practically necessary in dealing with infected clothing, bedding, and other objects.

3. That the alternate use of moist and of dry heat, or of both conjoined, is preferable to the use of dry heat exclusively.

4. That in disinfection by heat, the immediate and certain destruction of volatile contagious matter can only be ensured by passing such matter through the flames of a furnace.

The important distinction that obtains between the vitality of the spore, or germ, or particles, and the organism which is developed from the spore, is all in all in considering the practical application of heat in the process of disinfection. For the quality, degree, or duration of the heat which destroys the vitality of bacteria, torula cells, spiral fibres, and fungi

fails to destroy the spore of the bacterium. We have quite a cloud of witnesses as to the effects of heat on germs and their offspring, for the long contention on the doctrine of spontaneous generation that has so very recently received its quietus, brought into the field of practical investigation a host of observers. A very favourite method of experimentation consisted in heating or boiling infusions of vegetable or animal material, in which bacilli, bacteria, and vibrios are so readily and so abundantly developed. On the point merely of the degree of heat that will destroy bacteria, there is a pretty general concurrence of experience, and Pasteur, Chauveau, Calvert, Roberts, Tyndall, and many others have shown that from 140° to 212° F. is a degree of temperature that few developed organisms can sustain. Huizings agrees with Cohn that bacteria are killed by 10 minutes boiling; but, against this general assertion, Roberts has shown that the length of time varies greatly, according to the nature of the matter that develops the bacteria —one kind requiring 20 minutes', another 40 minutes' boiling. If, however, the infusion is rendered alkaline, Roberts alleges that it was not sterilised until one or two, or even three hours' boiling. Mr. Dallinger and Dr. Drysdale report that while certain living septic monads were killed by a heat of 140°, there were spores of one variety that generated after exposure for 10 minutes to 200°. Instances are recorded of certain spores resisting for hours a temperature of 400° F. The resistance to destructive agents of certain spores is very extraordinary. Koch relates that the spores of splenic fever, a disease of cattle that occasionally affects, and it may be in a fatal form, the human subject, retained their infective vitality for an indefinite period in spite of all kinds of mal-treatment. They could be reduced to dust, wetted and dried repeatedly, kept in putrefying liquid for weeks, and, nevertheless, at the end of four years, they still displayed an undiminished virulence. Such experiences give point to the principle for which I am contending —viz., that in disinfecting by heat the only effective application for the immediate destruction of infective matter, suspended in the air, is to subject it to the action of flame.—*Glasgow Medical Journal, Nov.* 1883, *p.* 337.

7.—ON THE TREATMENT OF RHEUMATIC FEVER BY SALICYLATE OF SODA.

By DAVID THOMSON, M.D.Glasg., Surgeon to the Luton Cottage Hospital.

Whatever may be the cause of it, no doubt can exist as to the best remedy for rheumatic fever. In no disease have more remedies been tried, and until the introduction of salicine and

its compounds the results were not by any means satisfactory. Writing to the Lancet in 1878, I stated that the treatment of this disease by salicylate of soda was that which gave by far the best results. An extended experience has confirmed this, but while I said then that frequently repeated doses of not less than ten grains should be employed, it has also shown me that doses of not less than double that amount should first be given. By giving doses of twenty-five or thirty grains every two hours the disease may be got under control in twenty-four hours, or in more severe cases in forty-eight hours. I do not mean to say that it can be cured in that time, but the urgent symptoms are relieved. The patients themselves note the relief obtained from commencing the remedy, not a very usual thing. Having got the more urgent symptoms subdued, and the disease in hand as it were, we may reduce the frequency of the drug. In the communication I have already alluded to I stated that the salicylate should be gradually reduced both in quantity and as to the frequency with which it should be given. This is undoubtedly the case, for if we suddenly stop it, immediately on the cessation of the urgent symptoms, say in twenty-four or forty-eight hours, they will certainly return, in diminished force probably, but they will return. The disease has been subdued, but not yet conquered, and it is requisite that the remedy should be continued for a few days, in smaller doses possibly, but at any rate less frequently, alternating it at first with other remedies, such as quinine or iron, and gradually diminishing the frequency of its administration until it is safe to discontinue it entirely. And I believe these to be the reasons why many have been and are disappointed in the use of salicine or its compounds. They do not give sufficiently large doses, and they abruptly discontinue its use. As I have just stated, both courses are wrong, and as bearing on this point I will just state what occurred in one of my cases above noted. He is a delicate boy, and I did not, as is my custom, give the salicylate of soda (the compound which I almost exclusively employ) in full doses. When I first saw him his temperature was 104°, and his pulse 130. I prescribed for him ten-grain doses to be frequently repeated. Being very busy I did not see him until the following evening, just thirty-six hours after my first visit, when his temperature was 107°, his pulse 156, his tongue brown, almost black, and perfectly dry, and his symptoms altogether of a most alarming nature. Having faith in the efficacy of the remedy, and believing that if given in sufficiently large doses administered often enough it would give the desired relief, and believing that the increase in the severity of the symptoms was due to his not having received enough of it, I immediately prescribed fifteen-grain doses, to be given

every hour, with the result that in twelve hours the temperature had gone down four degrees, and in twelve more it had gone down an additional three degrees, so that in twenty-four hours the temperature had become reduced by seven degrees, while the pulse was reduced in frequency from 156 to 96 beats per minute. The delirium also from which he was suffering on the previous day had disappeared entirely and the tongue was moist and clean. On the next day the temperature was normal, and remained so, and he progressed uninterruptedly until a few days afterwards, by an inadvertence, the salicine, which he was taking alternately with quinine, was abruptly stopped. I felt sure, on learning what had occurred, that there would be a relapse; and in forty-eight hours the malady returned, but was soon subdued by having recourse to the former treatment, and all went on well.

Two mistakes were made in this case: first, in not giving a sufficiently large dose of the medicine; and second, in too soon discontinuing it. The only reason I can give for departing in this instance from my usual plan of giving full doses, is the influence on my mind excited by the statements published respecting the depressing effects of the salicylate of soda on the heart. I have now given it for years, always commencing with it and using no other drug until the disease has been well got under, and have never seen those ill effects, though I have pushed it many times until what are called its toxic effects have been very apparent. It did occur to me that this might be a case in which it would produce depression if it ever did so, and consequently I gave the smaller dose, to my patient's misfortune and my own annoyance.

I do not know of any means (certainly of no drug) whereby the temperature could be lowered so quickly, and to such a degree, and the other symptoms equally relieved, as by this, except the cold bath, and against this measure great prejudice exists; while we are trying to persuade the friends to use it the patient is getting worse. Besides, while the cold bath only lowers the temperature, salicine acts by reducing the temperature and destroying the poison. If hyperpyrexia be due to implication of the heat centres by the rheumatic poison, what is more rational than that we should administer the antidote, if we have such? Unfortunately, in too many cases we are not able to do this, but in this particular case we can do so, for in salicine we have an antidote, or, in other words, a specific. The form in which I am in the habit of giving it is in combination with soda, though Dr. Maclagan recommends salicine alone. Occasionally, though rarely, I have found the former disagree, causing nausea and vomiting, in which case I have substituted the latter, which is usually retained (though not always), but

which does not produce such a decided effect upon the disease. All the six cases that I have alluded to, with the exception of one, occurred during cold weather; all but two in damp weather in the spring or early summer. Only one could be said to occupy what had any pretensions to be called a damp situation. All were young but one, a female aged forty. Four had a previous history of rheumatism in the family, though none of them had personally suffered before. The poison, then, of rheumatic fever cannot be of paludal origin. Yet it may be malaria taken in its wider sense of "bad air." It may be a "terrestrial aeriform emanation." "The now well-known factors of malaria poison are vegetable decomposition, moisture to saturation, subsoil and water almost at the surface, and a high temperature; heat above 60°." Now, the conditions under which rheumatic fever is generated do not answer to this description by any means. Yet it may be due to a malarial poison generated under conditions different from these. And that it is a poison derived from without I have long felt inclined to believe, though at present this is merely a belief. No actual proof can be given of its existence. Considerable weight is lent to the theory of its external origin from the success of the treatment, and on the other hand, weakness attaches to the lactic acid theory from the want of success attending the treatment carried out in accordance with that belief.

I am inclined to conclude that the poison of rheumatic fever is derived from without; that, though it arises under circumstances incompatible with the belief that it can be of malarious origin as usually understood, yet it is not improbable that it may be a terrestrial aeriform emanation. And we have ample reason to show that, whatever be the nature of the poison, salicine and its compounds exercise such a beneficial action over it as to entitle them to be called specifics. Nor is the method employed by some, of giving it with a half belief in its efficacy, in small doses, of any utility; indeed, it is worse than not using it at all, for while it affords no relief to the sufferer, it at the same time brings discredit upon a remedy of great value.—*Lancet, Dec.* 29, 1883, p. 1123.

8.—ON "COLDS" AND "CHILLS."

By the EDITOR OF THE LANCET.

Colds are chills, and chills are prolonged depressions of nerve force, without the reaction which should occur immediately after the collapse. Nineteen persons out of twenty misuse this word "reaction," and the misuse involves more than an error, or confusion, of terms. There are *three* stages of every

strong impression made on a living organism. First, the attack—in this case the chill; second, the pause, like a dead-point, during which the organism is depressed—that is, lying under the stunning effect of the attack; and third, the reaction. The "reaction" cannot occur until after the dead-point, and the mistake commonly made is to speak of the stage of exhaustion or depression which follows any severe impressions as the reaction, whereas it is precisely because no reaction occurs and the dead-point is prolonged matters go amiss. The physiological, or perhaps we ought to say the pathological, process of a cold has been thus described: When the surface of the body or the air-passages are chilled by a draught or by being drenched with rain and sitting in cold damp clothes, lying in damp-sheets, and the like, the mischievous impression is made, not on the skin itself or on the lining membrane of the air-passages, but upon the vast network of minute nerve-filaments which lies beneath these membranes, and connects the surfaces of the body—both external and internal—with the nerve centres, which are the sources and foci of energy and power. These nerve-centres receive, through the multitudinous branches of telegraph-like afferent nerves converging to them, a shock or staggering impression which for the moment paralyses them; and during this paralysis or stupefaction the vaso-motor, or vessel-contracting centre, whose peculiar function it is to regulate the calibre of the blood-vessels, gets the upper hand, and these blood-vessels are contracted so that they carry less blood than usual. The smaller branches of the arterial system, which form a network immediately underneath the skin and give it its bright pink colour, are so reduced in "bore" or calibre—as any elastic or compressible tube may be reduced—that the red blood does not flow through them, and the surface looks pallid. This is the first effect of "chill." Presently comes the recovery from this state, or the "reaction" as it is called, when the first effects of the shock have passed away and the centres begin to revive. Now occurs the critical moment. If the shock has been great, and the recovery is slow or imperfect, as often happens in a depressed or what is called a "delicate" state of the organism, the vaso-motor centre, which of course shares the general depression, though it is not the first to feel it and show it, will give way before the reaction is established; and then the heart, bounding in its recovery, pumps its blood into unduly yielding and unstrung vessels, and dilates them, and local congestions or accumulations of blood may take place, while the absence of proper resistance excites the heart to tumultuous action, and the disturbances of fever and inflammation occur. It is a question of the balance in power between

two parts of the nervous system, the general and the particular —the latter being the centre that regulates the calibre of the blood-vessels—and this practically resolves itself into a question of time. If the reaction of the general nervous system be quick, there is a rush of blood to the surface vessels, and due resistance being found, the heart quickens its pump-like action, and the sweat-glands are thrown into activity, so that perspiration ensues. If, on the other hand, the vaso-motor centre has participated seriously in the shock of the chill, the muscular coats of the vessels are not properly contracted; they have lost their tone. Then the blood propelled to the surface simply dilates the vessels, so that there are the redness and heat of "fever" or pyrexia, and the skin remains dry; there is rapid action of the heart, partly because there is less than the normal resistance to overcome, and partly because the vagus fails to exert its inhibitory action, and both the muscular structure of the heart and the respiratory centre are left uncontrolled, but the current of the blood moves slowly through the vessels, and the heart wave is perceptible in the arterioles, and is present in the capillary area. Coincident with these mechanical actions and reactions, involving departure from the healthy condition of the circulation, occur disturbances of the chemical processes of health and consequently alterations in the nutritive relation of the various tissues of the organism and the blood. What then is a cold? Clearly it is a disturbance of the balance between the several parts of the nervous system, brought about by the shock of a sudden or prolonged exposure to the depressing effect of "chill"; although the same physiological results may be produced in the organism by the operation of any agent which is capable of giving the nervous system a similar shock, and thus creating the same kind of disturbance. Nature's provisions against the consequence of a "chill" and for the prevention of a "cold" are *sneezing* and *shivering*. A violent fit of sneezing often saves a chilled body the consequences of the nerve depression, or "shock," to which it has been subjected; and this shock may in its first impression be very limited in its area; for example, the small extent covered by a draught of cold air rushing through the crevice of a door or window. The nerve centres are aroused from their "collapse" by the commotion or explosive influence of the sneeze. If sneezing fails, nature will try a shiver, which acts mechanically in the same way. If this fails, the effects are likely to be very serious, and bad consequences may ensue. The popular notion reverses the order of events, and hence the saying, "If there is sneezing the cold will be slight, if there is shivering it will be grave;" whereas it is slight when sneezing suffices to recover the nervous system quickly from

its depression, and grave when even strong shivering fails to do so. In case of chill, with threatened cold, sneezing may be produced by a pinch of snuff of any kind. This is how some of the vaunted "cures" of cold by snuff are brought about. Or brisk exercise may ward off the attack. The popular idea is that the circulation is restored by these remedies, but the true explanation is that the nervous system and centres are aroused. The first step towards an intelligent treatment of chill and cold is a scientific recognition of their nature.—*Lancet, Nov.* 24, 1883, *p.* 912.

9.—ON A TYPICAL CASE OF MYXŒDEMA.

By F. G. D. Drewitt, M.D., Assistant Physician to the West London Hospital, and to the Victoria Hospital for Children.

At a meeting of the Clinical Society of London, Dr. Drewitt exhibited a typical case of myxœdema in a woman, aged forty-five, who had been an out-patient at the West London Hospital during the last year. The disease was of twelve years' standing, dating from the time when the poor woman lost her husband and one of her children. At that time she was slightly built and active, but since then she had gradually become stout and heavy, slow and languid and feeble in moving, slow and deliberate and indistinct in her speech. She was afraid of going about alone, and she could hardly lift her feet high enough to get upstairs. She was always cold, even in summer, and never perspired. Her bowels were obstinately confined. There was dyspepsia, and she had partly lost the senses of taste and hearing. All the characteristics of the disease were present—the generally swollen look, the round and fat face, the sallow, translucent, wax-like skin, broad nose, thick, coarse, purple lips; on the cheeks was the same peculiar dusky reddish purple colour, caused by dilated capillaries and veins. The eyelids were pendulous and transparent; the tongue, which was pale, swollen, smooth, and tooth-marked, was too large for the mouth and more "cretinoid" than the intellect; the soft palate was also swollen and pale. The abdomen was greatly enlarged, as if from growth of fat; the swelling, in fact, was universal, but there was nowhere pitting on pressure. The skin of the hands and arms was rough and scaly, as in xeroderma. The hands were thick and swollen, and could no longer be clasped. The wedding ring became embedded in the swollen finger, and had been cut out by a jeweller. Pulse 76, feeble. The heart sounds were distant, feeble; no murmur. Temperature in axilla only 95°. Urine sp. gr. 1011. No albumen or sugar. Dr. Drewitt remarked that the spade-like, clumsy hand had been especially noticed by Sir William Gull in his paper

read before the Society, just ten years ago, in which he described the disease for the first time, but he thought that the most striking physical peculiarities were the pendulous eyelids, like alabaster in translucency, and the purple pouting lips. Tranquillity was also, in those few cases he had seen, a most marked characteristic. Tranquillity of mind, undisturbed by emotion; tranquillity of body, undisturbed by change of expression, or by any sudden speech or movement. Though painfully conscious of their own state, there was no irritability. As to the pathology, Dr. Ord had described the post-mortem appearances. The whole connective tissue of the body had been found swollen and jelly-like, and œdematous with mucin. This swelling seemed sufficient to account for all the symptoms. The heart and arteries were obstructed by it, and hence the feeble blood current, the deficient aeration of the blood, and the purple of the cheeks and lips. The tongue and palate were swollen with it, the intestine choked by it, the senses dulled, the functions of organs interfered with, and the patients died with all their tissues smothered by their own padding. In the treatment of this patient he had found strychnia of the most value, and both muscular movement and speech had increased in briskness under it. In the appearance of the patient, however, there had been no improvement. As to the origin of the disease, it had been perhaps rightly ascribed to nerve influence. Great anxiety or mental shock had occurred at the beginning of many cases. In Dr. Ord's first case, as in the one now before the Society, it followed upon the fatal illness of a husband. In Dr. Cavafy's first case it followed a shock; in his second a bad time at childbirth. Dr. Duckworth's second patient mentioned that it came on after her husband had kicked and ill-treated her. Dr. Semon's patient had fourteen children and some miscarriages in a "comparatively short time." The secretion of gastric juice, saliva, bile, were all influenced by emotion; mental shock was alleged to be a cause of atrophy of the liver; and syncope might follow bad news; therefore it would not be wonderful if it should be shown that the nutrition of the connective tissue of the body was altered in this way. Sir Wm. Gull, in his paper, had alluded to the changes in the thyroid in true cretins. It would be interesting to know whether instances either of atrophy or hypertrophy of the thyroid had been observed in any of these cretinoid cases.—*Lancet*, *Dec.* 1.

10.—MYXŒDEMA.—PROF. KOCHER ON EXTIRPATION OF GOITRE AND ITS CONSEQUENCES.

By Dr. FELIX SEMON, of St. Thomas's Hospital.

[In the discussion which followed the reading of Dr. Drewitt's case, related in the preceding article, Dr. Semon gave an

account of some very important observations of M. Kocher, having an important bearing on the function of the thyroid body, and on the pathology of myxœdema.]

At the twelfth Congress of German Surgeons, held at Berlin in April of this year, Prof. Kocher, of Berne, the Professor of Surgery to the University of that town, had read a paper on "Extirpation of Goitre and its Consequences." The author's personal experience was based upon no less than 101 total or partial extirpations of goitres, and was second to no living surgeon's except that of Prof. Billroth. In the first part of his paper he discussed the operation itself and its indications; in the second part he spoke of the consequences of the operation. His attention was drawn to the after-state of his patients by the report of the general medical adviser of one of his patients, upon whom he had performed the operation as far back as 1874. This gentleman informed him that gradually since the operation a completely cretinoid change had made its appearance in that case. Prof. Kocher having seen the patient in question himself, was so much surprised to see the extraordinary changes which had taken place, that he immediately requested all his patients upon whom he had performed that operation—except those only very recently operated upon—to present themselves for the purpose of a re-examination. By many circumstances (death, loss from view, cancerous nature of the goitre, inability of attending personally, &c.) the number of those attending personally was reduced to thirty-four. In sixteen of these cases a partial extirpation only had been made —*i.e.*, one lobe with or without the isthmus had been removed. In all the cases belonging to this category, the result of the operation had been an excellent one—*i.e.*, the dyspnœa, for which the partial extirpation had been performed, had disappeared, and the general health had suffered in no respect. Matters, however, were entirely different with regard to the eighteen patients on whom total extirpation of the thyroid body had been performed, and who put in a personal appearance. Of these eighteen, two only showed an undeteriorated, or even improved, state of health. But it was a most remarkable circumstance that in one of these two cases a small accessory thyroid gland had undergone a hypertrophic change, and that in the other a recurrence of the goitre had taken place. All the remaining sixteen patients showed more or less considerable derangement of their general health, the changes being much more developed in the oldest cases than in those more recently operated upon. These changes were therefore of a distinctly progressive character. As to the nature of the changes themselves, they were, in the order as related by Prof. Kocher, the following:—A few months after the operation,

early fatigue, weakness, and sensation of heaviness in the limbs were complained of. In many cases these were preceded by actual pains in different parts of the body. Soon afterwards a sensation of coldness, especially in the extremities, was superadded. In winter time the hands and legs swelled, became bluish-red and cold, and the patients suffered from chilblains. The mental activity decreased; thought, speech, and movements became slower. At the same time the patients were themselves painfully aware of these facts. Simultaneously with the above symptoms swellings of the face and body made their appearance. They were sometimes at first only transitory, but soon became lasting features. The parts most and earliest affected were, as a rule, the infra-ocular region and the eyelids, which showed a somewhat transparent swelling; later on, the nose became thick, the lips coarse, hands and feet swollen, and the waist stouter; the skin became dry, desquamated a little, was infiltrated, and its elasticity lost; it could only be lifted in thick folds; hair fell out. A most marked symptom in the more progressed cases was anæmia. Examination of the blood showed a relative richness of leucocytes, inasmuch as the number of the red blood-corpuscles was greatly diminished. In the cases in which the patients at the time of the operation were still growing, the development became most markedly arrested after the operation. Rarer symptoms were slight dysphagia, giddiness, and headache. Ophthalmoscopic examination, made in a number of cases by Prof. Pflüger, did not reveal anything abnormal beyond remarkable narrowness of the arteries. Prof. Kocher concluded his description, of which the most prominent features only were given in this epitome, by the remark that the relationship of the above complexity of symptoms to idiocy and cretinism was unmistakable. Being himself unaware of the existence of myxœdema, he proposed for the affection he described the name of cachexia strumipriva (struma=goitre). Observations similar to those of Prof. Kocher's had been made by Prof. Reverdin of Geneva. Dr. Semon added that in a case of his own, in which Prof. Lister had kindly removed the thyroid body *in toto* three years ago, great pallor and occasional swellings under the eyelids had since made their appearance, as he had ascertained by making inquiries. The patient also suffered frequently from general malaise. He would not, however, attribute too great a value to written reports, and communicated this for the sake of completeness only. Returning to Prof. Kocher's paper, he regretted that time did not permit him to enter upon the highly interesting and ingenious hypotheses by which this author had tried to explain the nature of the changes described

by him. He (Dr. Semon) thought, however, that the identity of these changes with those met with in myxœdema, which he had found when reading through Prof. Kocher's paper, was very evident. Not one symptom was present in myxœdema which was not met with in these cases of total extirpation; on the other hand, one symptom only had been observed in a certain number of these cases which was not present in myxœdema—viz., the arrest of the growth of the body after total removal of the gland in children. But the explanation of this difference was obvious: myxœdema was essentially a disease of adult life. Looking upon the whole question from a broad point of view, there appeared to be three conditions closely allied to each other, and having in common either absence or probably complete degeneration of the thyroid body—viz., cretinism, myxœdema, and the state after total removal of the thyroid body, which latter operation, he wished to remark particularly, was not only a surgical operation, but also a very pure physiological experiment. In all three states certain conditions of arrested development of mind and body were met with, which looked upon in the new light thrown upon the subject by Prof. Kocher's observations could hardly be attributed to anything else than to the loss—for loss it practically was—of the thyroid body common to them all. The obscurity of the physiology of this gland was, as had been justly observed, a true *opprobrium medicinæ*. Speculations as to how these changes were brought about, and what was the exact influence of the thyroid body upon the composition of the blood and other tissues, seemed at present to be premature; but it was perhaps not too bold a hypothesis to assume that, if the absence of the thyroid gland could lead to arrested development of mind and body, it might also lead to arrest of development of the higher forms of organised tissue, and that under such conditions the lowest type of organised tissue—the fœtal tissue—mucin, was mainly formed, and in excessive quantities. In this way the excess of mucin in the tissues, which had been supposed to be the essential feature of myxœdema, might possibly find its explanation.—*Lancet*, *Dec.* 1, 1883, *p.* 952.

11.—ON THE TREATMENT OF SNAKE-POISONING.

By Sir Joseph Fayrer, K.C.S.I., F.R.S.

I will briefly describe the measures to be adopted in the treatment of snake-poisoning, and especially refer to the permanganate of potash as a remedy.

The first and most important indication is to prevent the poison entering into the circulation; to this all else is subsidi-

ary. The rapidity with which this takes place depends a good deal on the part of the body bitten, and on its vascularity. When the poison enters a vein, if the bite be inflicted by a vigorous snake, the result is generally rapidly fatal. Experiments on animals show that bites inflicted on parts, even where large veins are not implicated, produce their effects so rapidly that only immediate severance of the part or complete constriction can prevent absorption. It is necessary therefore, as quickly as possible after a bite has been inflicted, to apply a ligature above the wound, and so tighten it as to completely arrest the circulation. As it happens in 94 per cent. that the bite is inflicted on an extremity, this may frequently be accomplished. But in parts where no ligature or elastic bandage or cord can be applied, proceed at once to excise the bitten part; this, indeed, should be done in all cases, ligatured or not. Then make an incision through the bite, reflect the skin, expose the tissue wherever that is altered in colour, dissect it out, and be careful to remove every part of it; next apply cautery or some escharotic, or the permanganate solution, taking care that it reaches as much as possible in every direction where the poison may have infiltrated. After this is done the ligature may be relaxed, for if the virus be destroyed the danger of its entering the circulation is past. Should it have already entered, as is only too probable, all that can be done is to give stimulants; keep the patient warm, at rest, and if the respiration begin to fail use artificial respiration, and endeavour to keep him alive till the poison be eliminated; the temperature should be maintained. In 1869 I gave instructions for the treatment of snake-bite, and, excepting that I would substitute Esmarch's bandage for the ligature recommended by Dr. Wall—that permanganate of 5 per cent. solution should be applied to the wound when the venom has been carefully dissected out, or injected when it has not been cut out—I have nothing to alter in these suggestions. Suction, being unlikely to be of much avail, is practically useless to the patient and dangerous to the operator, and it should be discouraged, and not relied on. Where the poison has happily been limited to the seat of inoculation, and in cases where no great quantity of virus has been absorbed, we may hope to do good, but where the poison has entered the circulation in larger quantities and the physiological symptoms are developed, the prognosis is exceedingly unsatisfactory.

Instructions.—As soon as possible after a person is bitten by a snake, apply a ligature made of a piece of cord, or an elastic bandage, round the limb or part at about two or three inches above the bite. Introduce a piece of stick or other lever between the cord and the part, and by twisting, tighten the ligature to the utmost. After the ligature has been applied cut

the punctures to the depth of a quarter of an inch with a penknife or other similar cutting instrument; let the wounds bleed freely; or, better still, excise the punctured part and all the infiltrated areolar tissue subjacent to it. Apply either a hot iron or a live coal to the bottom of these wounds as quickly as possible, or inject into the subcutaneous cellular tissue a solution of permanganate of potash—5 per cent., or some carbolic or nitric acid. If the bite be where a ligature cannot be applied, with a sharp penknife cut out the bitten part and all the infiltrated cellular tissue to a depth of a quarter or half an inch. Then apply the hot coal or hot iron to the very bottom of the wounds, or better, the permanganate of potash. Give fifteen drops of solution of ammonia diluted with an ounce of water, immediately, and repeat it every quarter of an hour, for three or four doses, or longer, if symptoms of poisoning appear. Or give hot brandy, or rum, or whisky or spirits, with equal parts of water, about an ounce of each (for an adult) at the same intervals. Suction of the wounds is not very likely to be beneficial, and as it may be dangerous to the operator, it cannot be recommended. If symptoms of poisoning set in and increase, if the patient becomes faint or depressed, unconscious, nauseated, or sick, and respiration begins to fail, with symptoms of paralysis of tongue and fauces, apply mustard poultices, or solution of ammonia on a cloth, over the stomach and heart; continue the stimulants and keep the patient warm, but do not shut him up in a hot, stifling room, or a small native hut—rather leave him in the fresh air than do this. Chronic—*i.e.*, milder—cases must be treated on the same and general principles. Do not make him walk about if depressed; rouse with stimulants, mustard poultices, or ammonia, but let him rest. If the person be brought, as he or she probably will be, some time after the bite has been inflicted, and symptoms of poisoning are present, the same measures are to be resorted to; they are less likely to be successful, but nothing else can be done. In many cases the prostration is due to fear; the bite may have been that of a harmless or exhausted snake, and such will rapidly recover if so treated and encouraged. If poisoned, but as frequently is the case, not fatally, these measures are the most expedient. A plain summary or translation of these suggestions might be hung up in public places. The people should be warned against incantations, popular antidotes, and loss of time in seeking for aid. Every police inspector, of whatever grade, might be taught the application of the simple measures I have described, and should be enjoined to make them known as widely as possible among the police and the people. There can be little doubt that recoveries from Indian snake-poisoning occur chiefly in cases where the snake has been ex-

hausted or harmless, or has bitten imperfectly, and in a few cases where prompt interference has prevented the entry of the poison into the circulation.

Let me now make some remarks on the remedial value of permanganate of potash. During my investigation of the value of remedies for snake-poisoning permanganate of potash was not omitted, and I made the following experiments:—

June 12th, 1869: A fowl was bitten by a cobra in the thigh at 3 p.m.; at 3.1′50″ p.m. fifteen drops of solution of permanganate of potassium were injected into the spot. Dead in seven minutes, 3.35 p.m. Forty drops of solution of permanganate of potassium were injected into the external jugular of a dog. This produced no apparent effect on the animal. At 3.48 p.m., bitten by a cobra (which had bitten before and was not fresh) in the thigh, the fang punctures were at once washed with the strong solution of permanganate, and was well rubbed in. 3.52 p.m.: Sixty more drops were injected into the ven. 3.54 p.m.: Two drachms were injected into the bowel, all the symptoms of cobra poisoning advancing rapidly. 4.12 p.m.: Forty more drops were injected into the jugular vein. 4.15 p.m.: Dead in thirty-seven minutes.

In 1878 Dr. Lauder Brunton and I made the following experiments, which confirm the power of the permanganate to neutralise the poison before it has entered the circulation, but shows its inefficiency when it follows it.

Experiment 1.—Five milligrammes of poison were dissolved in one cub. centim. of water, and mixed with one cub. centim. of liquor potassæ permanganatis (B.P.), and injected under the skin of a guinea-pig. No symptoms were produced, and the animal remained quite unaffected.

Experiment 2.—Two rabbits of the same litter, each weighing exactly 2lb. were taken. Five centigrammes of cobra poison dissolved in one cub. centim. of distilled water were mixed with one cub centim. of liquor potassæ permanganatis (B.P.), and allowed to stand for about eight minutes. The mixture was then injected under the skin of the flank of one rabbit. No symptoms whatever were produced, and the animal, though kept under observation for some weeks, remained quite unaffected by the poison. Five milligrammes of cobra poison, dissolved in two cub. centims. of water, were injected into the other rabbit at the same time. During the ejection a little of the poison was lost, so that the animal did not receive the full dose, yet it died in thirty-minutes.

Experiment 3.—April 4th, 1878. Guinea-pig weighing 1¼lb. Injected four centigrammes of cobra poison into leg. 4.1 p.m.: Ligature applied immediately; permanganate of potash applied immediately. 4.5 p.m.: Twitching. 4.10 p.m.: Dying. 4.13 p.m.: Convulsion. 4.14 p.m.: Dead.

Experiment 4.—April 4th, 1878. Guinea-pig weighing 1lb. 3.45′ 20″ p.m.: Injected ¼ gr. = 4 centigrammes—of cobra poison under skin of leg. A ligature was applied round the leg in one minute, and in five minutes permanganate of potash was rubbed into an incision made over the site of injection. 3.52 p.m.: Ligature cut. 3.53 p.m.: Twitching violently, leg paralysed. 3.57 p.m.: Dying. 3.58 p.m.: Dead—less than thirteen minutes.

Dr. Wall, who has carefully investigated the subject, makes the following pertinent remarks:—"As it was found that potassium permanganate does destroy the poison, steps were taken to see if it would be of any practical use in the treatment of animals suffering from snake-bite. It was found by experiment that a considerable quantity of potassium permanganate, dissolved in a weak saline solution, could be injected into the circulation of an animal without producing any immediate effect. A dog suffering from cobra poisoning had a cannula placed in its saphena vein, a solution of potash was injected, but though a large quantity was cautiously and gradually introduced into the circulation, and though, at the same time, life was prolonged by artificial respiration, in no way was the least benefit to be perceived from the remedy. The reason is obvious. It is quite true that permanganate of potash destroys the active agent of cobra poison by oxidising it; but when introduced into the blood it, of course, commences oxidising indifferently all the organic matter with which it comes in contact, but it has no power of selecting one organic substance for oxidation rather than another. The oxidising power of the permanganate is, therefore, exerted on the constituents of the blood generally instead of being reserved for the cobra poison in it alone; so if cobra poison is dissolved in an organic solution, and the permanganate is added before injection, the poison suffers little, if any, diminution in strength, for the oxidation has taken place chiefly at the expense of the other organic matter. Thus it would be necessary to destroy all the constituents of the blood by oxidation before all the poison in it could be destroyed too. If a substance should be found having the power of oxidation with a special affinity for exercising it on snake-poison, the problem of the treatment of snake-bite would be solved; but permanganate of potash has not this special power." It has been pointed out that there are other substances which greatly diminish or destroy the action of snake-poison when mixed with it out of the body. Of all such agents, permanganate of potash is probably the best; still it seems to be of little value in practice.

Wall further remarks, "It may be asked, why, if metallic salts, tannic acid, hydrate of potash, and permanganate of

potash, destroy snake-poison, should not these substances be used in preference to excision? The reply is obvious. If we could know the exact position of the poison, and if there were only one deposit, we might probably succeed in destroying it by injection. But to remove the poison deposited by the bite of a snake requires a most intelligent observation, guided by eyesight and judgment; but an injection of a chemical agent must be to a great extent made by guess-work, and the solution, instead of following the poison, takes the line of least resistance in the tissues, often leading it far from the poison."

In a pamphlet dated 1882, Richards says: "A solution of 5 per cent. of permanganate of potash is able to neutralise the poison"; and recommends that this should be injected into the bitten part after a ligature has been applied; it is less likely to cause sloughing of the tissues than any other agent which could neutralise the venom. In the letter of July 22nd, 1882, he says: "It is in my experience the best local application we possess. It is not a physiological antidote, but is a chemical one; but is utterly powerless to effect any influence on the lethal action of snake-poison." He means the constitutional action. He is of opinion "that wherever opportunity offers the injection of permanganate of potash should be resorted to, assuming that a ligature has been efficiently applied (where it can be applied at all) within five minutes from the bite. In the average run of cases the permanganate will certainly destroy the poison beyond the ligatured part," if it come in contact with it; but, as Wall pointed out, the difficulty of ensuring the contact with the poison is so great as to render it practically unreliable. I agree with Richards that, so far as it goes, it is a good local application, and as such it ought to be used; or, in its absence, tannic acid or liquor potassæ might be resorted to with the same object; but as a constitutional remedy, as a physiological antidote, it is powerless, like all others that have been tried and failed to do good; and Lacerda himself, although he attributes the highest value to it as a chemical antidote, both as a powerful oxidising agent and by the action of the potash, says: "As to the idea of finding a physiological antidote for snake-poisoning, I entirely agree with you that it is a utopia."

After careful consideration, fully admitting that in permanganate of potash we have an agent which can chemically neutralise snake-poison, as indeed was shown by Dr. Brunton and myself in 1875, I do not ascertain that more has been done than to draw attention to a local remedy already well-known as a chemical antidote, the value of which depends on its efficient application to the contaminated part (which Dr. Wall has pointed out is too uncertain to be reliable), and we are still as far off an antidote as ever, whilst the remarks made by me

in 1868 are as applicable now as they were then. They were as follows:—"To conceive of an antidote (as that term is usually understood) we must imagine a substance so subtle as to follow, overtake, and neutralise the venom in the blood, and that shall have the power of counteracting or neutralising the poisonous and deadly influence it has exerted on vital force. Such a substance has still to be found, nor does our present experience of drugs give hopeful anticipation that we shall find it; but I repeat that where the poisonous effects are produced in a minor degree, or where the secondary consequences are to be dealt with, we may do much to aid the natural powers in bringing about recovery."—*Lancet*, *Feb.* 16, 1884, *p.* 288.

DISEASES OF THE NERVOUS SYSTEM.

12.—ON NITRITE OF SODIUM AS A TOXIC AGENT.

By Dr. SYDNEY RINGER and Dr. WILLIAM MURRELL.

Nitrite of sodium has of late been frequently recommended as a remedy for epilepsy, angina pectoris, and other diseases of nervous origin. Considerable diversity of opinion evidently exists as to the dose in which it may be safely administered. In those cases in which twenty grains are stated to have been given three times a day for three months or more, the drug was undoubtedly impure, for so large a dose could not have been administered for so long a time with impunity. It must be remembered that, until recently, the substance sold as nitrite of sodium was a mixture of nitrite and nitrate, the latter predominating. It has been shown by Dr. Hay and others that many samples of so-called nitrite of sodium contained more than two-thirds nitrate. Nitrate of sodium is a much less active drug than the nitrite, and can be given in much larger doses. As the nitrite has come more generally into use as a medicinal agent, manufacturers have taken greater care in its preparation, and as now sold it is almost pure. If the pure nitrite of sodium were administered in the doses in which the impure drug was formerly given the effects might be disastrous. We have recently made some observations on this point, and are satisfied that nitrite of sodium is a powerful toxic agent. As an indication of its activity, and of the symptoms it is capable of producing, we give details of some observations made on cats.

Observation 1.—A black cat, weighing 5½lb., was injected under the skin of the back with, 4 c.c. of a 10 per cent. aqueous solution of nitrite of sodium—a little over six grains, or about a grain to the pound. In fourteen minutes the animal was panting, the respiration being

superficial, and from 148 to 160 in the minute. The tongue was protruded, and was of a dark-blue colour. The pupils were widely dilated, and there was great muscular weakness. These symptoms increased in severity, urine and fæces were passed, there was slight opisthotonos, and in twenty minutes from the time of injection the animal was dead. At the autopsy, which was made immediately, it was found that the muscles were unusually light in colour, and that their contractility, as tested by the interrupted current, was quickly lost; in fact, in twenty minutes it was quite gone. On opening the chest and cutting the aorta, the blood was found to be very dark, almost like treacle. The lungs had a dark-chocolate tint, and were speckled. The left ventricle of the heart was contracted, whilst the right was dilated; both auricles were dilated, and no contraction could be obtained in either auricles or ventricles, even with the strongest current. On opening the abdomen the dark colour of the liver at once attracted attention, and further examination showed that the stomach, intestines, and bladder were firmly contracted. There was no vomiting before death, but the animal had not been recently fed.

Observation 2.—A brown cat, weighing 6¼lb., was injected under the skin of the back with 4 c.c. of a 10 per cent. solution of nitrite of sodium. In fifteen minutes it was noticed to be unsteady on its legs; respiration was 44 in the minute, and the mucous membranes were dusky. Two minutes later urine was passed freely, the respiration had risen to 100, reflex action was almost abolished, and sensation was notably diminished. Twenty minutes after the injection all power of locomotion was lost; the mucous membranes were of a dark-leaden colour, and the respiration was 104 in the minute. Ten minutes later there were slight convulsions, chiefly extensive, and in two minutes more, or thirty-three minutes after the administration of the drug, the animal died. At the autopsy the blood, as in the former case, was noticed to be very dark in colour. It was examined microscopically, but no change in the corpuscles could be detected. The loss of contractility in the voluntary muscles was well marked, and in half an hour no response could be obtained even with the strongest current.

These symptoms are quite in accordance with the results obtained by other observers. Binz and Barth found that nitrite of sodium produced toxic effects both in cold and warm-blooded animals. The minimum lethal dose injected subcutaneously was for a rabbit about three grains; a dog weighing nine pounds was killed by four grains in less than four hours. The results, too, are very much what might have been anticipated from analogy. It is well known that when an animal is made to inhale nitrite of amyl the arterial and venous blood assumes a

nearly uniform hue, resembling somewhat normal venous blood, but having a chocolate tint. Reichert, from his observations on potassium nitrite, came to the conclusion that "the nitrites cause the arterial and venous blood to become of a uniform dark venous colour, having a distinct brownish or chocolate shade, and that this is due to the conversion of the oxyhæmoglobin into a nitrite oxyhæmoglobin, and that the nitrite blood possesses very little oxygen absorbing power, and as a sequence hæmic respiration is seriously interfered with and tissue metamorphosis diminished." The same author found that in mammals the respiration rate was much affected, and that after the administration of even small doses it greatly increased in rapidity. If the dose were toxic the respirations became exceedingly frequent and panting, whilst if it were lethal they became slow and shallow until death ensued. Dr. Reichert thought that the respiratory centres were primarily stimulated from the asphyxiated blood and then depressed. The action on the voluntary muscles as noticed in our experiments is also in accordance with his observations.

The nitrates, as already stated, are much less active than the nitrites, a point well illustrated by an observation made in conjunction with our last quoted experiment. At the time that the brown cat was injected with nitrite of sodium, a white cat weighing 4¼lb. was injected under the skin of the back with 3 c.c. of a 10 per cent. solution of nitrate of sodium, or about four and a half grains. The dose, it will be seen, was smaller than in the case of the nitrite, but the cat weighed a pound and a half less, so that the comparative dose was nearly the same. The animal was carefully watched for two hours, but no effect of any kind was produced. The contrast was very marked: the nitrate cat was purring round the room, when its nitrite companion was having its post-mortem made. The difference in the relative activity of the two drugs is also well shown by their action on frogs. Several experiments were made on this point.

In addition to these experiments we have made some observations clinically. To eighteen adults—fourteen men and four women—we ordered ten grains of the pure nitrite of sodium in an ounce of water, and of these seventeen declared that they were unable to take it. They came back protesting loudly, and required no questioning as to the symptoms produced. They seemed to be pretty unanimous on one point—that it was about the worst medicine they had ever taken. They said if they ever took another dose they would expect to drop down dead, and it would serve them right. One man, a burly, strong fellow, suffering from a little rheumatism only, said that after taking the first dose he "felt giddy," as if he would "go off

insensible." His lips, face, and hands turned blue, and he had to lie down for an hour and a half before he dared move. His heart fluttered, and he suffered from throbbing pains in the head. He was urged to try another dose, but declined on the ground that he had a wife and family. Another patient had to sit down for an hour after the dose, and said it "took all his strength away." He, too, seemed to think that the medicine did not agree with him. Again, another patient said that in about half an hour after taking the first dose his heart came on beating very fast, and he throbbed all over. He felt very sick, but did not actually vomit. The women appear to have suffered more than the men, at all events they expressed their opinions more forcibly. One woman said that ten minutes after taking the first dose—she did not try a second—she felt a trembling sensation all over her, and suddenly fell on the floor. Whilst lying there she perspired profusely, her face and head seemed swollen and throbbed violently, until she thought they would burst. She felt sick, but did not actually vomit. This lasted about three hours. Another woman said she thought she would have died after taking a dose; it threw her into a violent perspiration, and in less than five minutes her lips turned quite black and throbbed for hours; it upset her so much that she was afraid she would never get over it. The only one of the fourteen patients who made no complaint after taking ten grains was powerfully affected by fifteen. He suffered from violent nausea, and his head, he said, felt as if it would split in two. The effect on these patients was so unpleasant that it was deemed unadvisable to increase the dose.

Sixteen patients, twelve men and four women, were ordered the nitrite in five-grain doses, and of these all the women and six of the men were unable to take it. The symptoms complained of were those experienced with the larger dose—faintness, nervousness, and a pain in the head. Nausea with eructation was of frequent occurrence, and in one or two cases there was actual vomiting. A young woman of twenty-four said she felt the effects of the medicine in about ten minutes, and had to lie down. She felt sick and then vomited, the vomiting lasting off and on for two hours. She had to keep her bed the whole day, and was so weak and ill that she thought she was dying. Another woman said the medicine upset her so much that she went off in hysterics, and could not hold a limb still. She lost all the colour from her face, becoming deadly pale. She had a terrible headache, which was worse when she moved, especially on going upstairs. These results were so unsatisfactory that we determined to try what a still smaller dose would do. To thirteen patients—all men this time—we ordered the drug in three-grain doses, and in only four cases was any com-

plaint made. These patients, however, suffered from the usual symptoms. One said "the medicine kept rising so that he could not keep it down," another complained that it "turned his lips blue, gave him a headache, and made him feel giddy," whilst the other two suffered chiefly from pain across the forehead.

It must be admitted that our experiences have not been altogether satisfactory. We have no doubt that nitrite of sodium is a valuable remedy, but we fancy most patients would prefer taking it in small doses. On reference to the literature of the subject, we find that several observers have met with unpleasant symptoms as the result of the administration of nitrite of sodium. In the discussion which followed the reading of Dr. Ralfe's paper at the Medico-Chirurgical Society, Dr. Ramskill said he knew of a young lady who, on taking the first dose, fell down with livid lips and staring eyes in a most alarming condition. Similar effects were observed in two other cases, and he considered it inexpedient to administer large doses (fifteen grains) to young persons. Dr. Ralfe has also met with cases in which toxic symptoms were developed. On one occasion he prescribed the nitrite in twelve-grain doses for three patients. Two were cases of epileptiform attack, and the other was a case of asthma. All three returned in a few hours with blue lips, in a state of semi-collapse, evidently poisoned by the drug.—*Lancet, Nov.* 3, 1883, *p.* 766.

13.—ON NITRITE OF SODIUM IN THE TREATMENT OF EPILEPSY, AND AS A TOXIC AGENT.

By A. H. Baines, M.R.C.S., L.R.C.P.Lond., Honorary Surgeon to the Southport Infirmary.

I have a twofold object in writing this paper: one, to show the undoubted efficacy of nitrite of sodium in the treatment of epilepsy, at least in the single case of a patient of mine; and the other, to suggest that medical men, in giving this drug, in whatsoever disease, should first ascertain whether it is a pure specimen or adulterated with nitrate of sodium; for if, as hitherto usually supplied to the profession, it is largely contaminated with this latter salt, comparatively large doses, as a scruple, will be required to produce the desired effect; whereas, if the drug is quite or nearly pure, one or two such doses might prove fatal, or, at any rate, bring about alarming symptoms. The salt I prescribed in the following case, though obtained from a first-class firm of manufacturing druggists, must have been far from pure, at least for the first few weeks of its administration, and until the untoward symptoms, which I shall relate, were produced, when presumably it was prepared in a

purer form, was therefore stronger, and, from the large doses administered, began to act in a poisonous manner. This hypothesis has weight lent to it from the fact that upon inquiry I found the undesirable symptoms were developed at the time that the drug was being dispensed from the first part of a new supply of it, the former supply having lasted perhaps seven or eight weeks. It is not unlikely that during this time, owing to a demand for greater purity in the drug, it became possessed of greater power; this condition belonging to it when it acted unfavourably. Of course this is only conjecture, but unless it has a basis of truth in it, it compels me to fall back on the only other hypothesis which I can think of—namely, that the drug is cumulative in its action; but I know of no evidence to support this view.

In the early part of this year I was called in to treat a lady, about thirty years of age, for very frequent attacks of petit mal; these occurring many times by day as well as night. She had suffered from this affection for some years, the severer and convulsive form of the disease being rarely manifested. She had been under treatment for a long time, with varying results, but with no permanent benefit. The bromides of course figured most conspicuously in the list of drugs, and from these, she assured me, she had derived much good. When I first attended her she was having, as I have said, very frequent attacks of petit mal, both by day and night, though she was, and had been for some time, taking as much as a drachm and a half of bromide of ammonium daily, in different combinations. The other bromides had been given a fair trial at former periods. I continued treatment with the bromide of ammonium for a short time, but soon decided that it had little or no influence on the number of the attacks. I now remembered having read an article in the Practitioner for June, 1882, by Dr. W. T. Law, "On the Treatment of Epilepsy by Nitrite of Sodium," in which he reported a successful case. I therefore resolved to try this method. I began by giving the salt in five-grain doses three times a day. Within a week or so I increased the dose gradually up to a scruple three times a day, the quantity Dr. Law recommended in his paper; and I will here remark that my patient took this amount uninterruptedly for a period of three months or more. Soon after this line of treatment was initiated her seizures began to diminish in frequency, and they were completely arrested in less than three weeks, and kept away entirely for ten weeks, when she broke down and had an attack during a day's absence from home. This relapse inaugurated a series of the old attacks, but they were distinctly under the control of the drug, which I continued to give in the same quantity, for their frequency was not nearly so great as

formerly. And now for the first time, after taking this medicine continuously for perhaps three months and a half (I cannot be quite exact, as my notes of the case are defective in this particular), symptoms made their appearance which caused me some anxiety. They were almost identical with those reported in the Lancet, the result of observations made by Drs. Ringer and Murrell (see preceding article). They consisted in great lividity of the lips and nails, and to a less but still marked degree of the whole face also; with most distressing sensations at the heart, almost indescribable, but compelling my patient to assume and maintain for hours together the recumbent posture, lest by rising something dreadful would happen to her. The heart was most turbulent and erratic in its action, and explained by its want of rhythm the great anxiety which the patient felt. She did not vomit, but felt sick, and the feeling of fulness in the head was only slight. I did not at once stop the medicine, but advised it to be taken less frequently. The untoward symptoms, however, continued or returned day by day, so that I was compelled to recognise that they were due to the action of the drug she was taking, and I stopped it absolutely; though at once strongly suspicious of their cause, I was somewhat unwilling to admit it as such, for the reason that the medicine had been taken so long and uninterruptedly without any but a beneficial result being produced. I now enjoined complete rest of body, and gave heart tonics combined with a scruple of bromide of sodium three times a day, and in a short time these alarming symptoms passed away, not to return. The seizures have been much less frequent since the drug was left off than before it was begun; and now my patient passes sometimes a fortnight without having one, the medicine just indicated being still taken.

In conclusion, I may state that I intend sooner or later to return to the attack with the same drug, but I shall try to get it in a pure form, and give it in only two or three-grain doses. I hope other medical men may be induced to try the nitrite of sodium in epilepsy, especially in those cases unamenable to treatment by the bromides, and that they will record their experience of it; but let me again urge upon them the caution which I have given at the outset of this paper.—*Lancet*, *Dec.* 1, 1883, *p.* 945.

14.—CASE OF MANIACAL DELIRIUM TREATED BY THE COLD DOUCHE.

By THOMAS BARLOW, M.D., F.R.C.P., London.

On the evening of March 30th I was asked by Mr. Gabe, of Farringdon-road, to see with him a man who was apparently suffering from a severe attack of delirium tremens. He was

thirty years of age, and a barman by occupation. He was said to be a "moderate drinker;" there was no history of any drinking bout immediately preceding this illness, but the alcoholic supply had been unlimited. He had not slept for three nights and four days; he had had many delusions, was much troubled with various objects in the room, more especially the bedclothes, which he was anxious to get out of his way. During the last twenty-four hours he had become much worse; it was doubtful if he recognised anybody; he had struck his wife and threatened to murder her; two men were required to keep him in bed. His bowels had acted, and he had taken a little food; but, as I have said, he had had no sleep, notwithstanding the administration of large doses of bromide, chloral, and morphia. The patient was an active, fairly developed young man, sitting up in bed when I saw him at eleven o'clock, with a wild, bothered look, muttering incoherently and pulling violently at a sheet which was in front of him. He was hardly in a mood favourable to investigation by ordinary methods. It was impossible to feel his pulse as he would not keep his hand still. On my making some slight attempts at physical examination, he told me he should "do for me" if I did not leave him alone. There was some tremor about his lips; he was much flushed; there was no rash; but his skin everywhere was dry, hot, and pungent to the touch. This struck me as noteworthy, because in all the cases that I could recall of very severe delirium tremens, the skin had been bathed in sweat. It appeared undesirable to order him any more narcotics, and my inclination would have been to let him alone, aiming simply at giving him food, but that evening I had read in the Lancet Dr. Broadbent's record of "two cases illustrating the successful employment of the cold douche." One of the two was a case of delirium tremens, and I suggested to Mr. Gabe that we should follow on the lines indicated by Dr. Broadbent. The bed and bedclothes were removed, and a large mackintosh coat was spread over the mattress, and over this a piece of sacking was placed. The patient was then stripped, and a spongeful of cold water squeezed down his neck and back, and then freely splashed over his face and chest. It quieted him immediately. He said it was nice, and he was well pleased to have it repeated. He was then vigorously rubbed and dried, and some strong broth was given to him, which he thoroughly enjoyed. During the rubbing process I noticed that he gave one short, loose cough. The bed was soon made; there was not the slightest difficulty in getting the patient to lie down and close his eyes, and presently he dropped into a quiet sleep. We left his friends with the instruction that if he became violent again the same treatment was to be

repeated, and that he was to have no physic, but only some egg and milk or broth whenever he should awake. His wife was also told by way of precaution that it was by no means infrequent in such cases (even when not treated by cold douche) to get pneumonia, and that therefore this was one of the things for which to be prepared. The patient slept quietly for four hours, then woke and was violent again. He was douched by the friends in the same way as before, and once more lay down and slept quietly. He had no delirium after this. A day or two subsequently, as I learnt from Mr. Gabe, the patient had a very slight cough and once expectorated a small quantity of blood-stained sputum. There was a little bronchial breathing at the left base, which soon cleared up. Thirteen days later, for my own information, I saw him with Mr. Gabe. He was perfectly rational; his tongue slightly granular. He had a good appetite, but looked thin, pale, and pulled down, like one recovering from a severe illness. His temperature was 99°. He had a very slight occasional dry cough, and then complained of a little pain, referred to the left posterior base, where scraping friction was to be heard, and where the resonance was slightly defective. He made a good recovery without the need of stimulants, and was strongly recommended to change his occupation.

Remarks.—Although it may be granted that the result of the treatment in this case was satisfactory so far as arresting the maniacal delirium was concerned, those who are timid with respect to the application of cold may reasonably ask if the douche was not responsible for the attack of pleuro-pneumonia from which the patient evidently suffered. On the contrary, I think there is reason to believe that when I saw the patient on the 30th with Mr. Gabe, he was at that time suffering from pneumonia (although it was impossible to prove it), and that his delirium was not more violent than one sometimes sees in drinking men the subjects of a pneumonic attack. His hot, dry, pungent skin was consistent with that possibility, and the short, loose cough which he presently gave was also consistent with it. I found on subsequent inquiry that the very first symptom from which he suffered was some severe rigors the night before the delirium commenced—that is, four days before the cold douche was applied. It is possible that the application of cold was of benefit in reducing his temperature, but I cannot help thinking that its chief benefit was as a nervous shock. We gave it with that view, and rubbed him very thoroughly afterwards so as to promote a good reaction and prevent his getting any chill. I know that Dr. Cayley (whose experience in the cold bath treatment in fever is very considerable) holds that the nervous shock is an important

element. Everybody who has employed cold baths extensively must have been struck with the marked improvement in intelligence which often takes place when a delirious patient is placed in the bath. In this case a cold bath was not to be got and the douche answered quite as well and gave much less trouble. "One swallow does not make a summer," but I have ventured to record this case as a pendant to those of Dr. Broadbent. There are some others referred to in Neale's Digest. It would be foolish to maintain that opiates have no place in the treatment of maniacal delirium, but I presume there are few physicians who cannot recall cases in which considerable and repeated doses of these remedies have been given without the slightest obvious effect on the delirium, and other cases in which even moderate doses have been followed by a sleep from which there has been no waking. Perhaps those who can recall such examples may feel inclined to give the cold douche a trial.—*Lancet, Jan.* 5, 1884, *p.* 9.

15.—ON TOBACCO POISONING.

By JONATHAN HUTCHINSON, F.R.S., Emeritus Professor of Surgery to the London Hospital.

Let me relate to you a case which is instructive, although not so well authenticated as to detail as I could wish. I had the narrative from a medical man of great intelligence, who was himself the subject of it. He told me that some years before I saw him, he had for some months been "nearly blind." He lost reading power, and "could scarcely recognise his friends." He consulted, separately, four distinguished ophthalmic surgeons. One said that he could find nothing amiss, but gave a gloomy prognosis. Another thought the optic discs pale, and another, that all that he could see were unusually large physiological cups. Two conjured him not to smoke; a third said he might smoke as much as he liked, and another omitted any opinion on this point. He had been smoking very heavily, and drinking very moderately. The failure had begun whilst on a visit to Germany, when he had smoked still more than usual, but a mild tobacco. In spite of the advice given he did not, as he says, in any way diminish his smoking. He took strychnia until his muscles jumped, but was no better. On one occasion, whilst at his worst, he dined with a friend and took "quite as much champagne as a respectable person ought to do." This was against his usual habit, which was to be abstemious in wine. The result was that when he reached his home after the dinner, he found, to his delight, that he could read small print. In the morning, however, his sight was as bad as ever. At length he consulted

a fifth specialist, who ordered him small doses of opium. Finding some, but not all the benefit he desired, he took not small doses, but large ones, and had the good fortune to have his vision steadily improve, until he could see again almost perfectly. He had some difficulty in leaving off his opium, but gradually diminishing the dose, he at length did so. Now Dr.—— assured me that he knew of no cause for this attack of amaurosis, nor of any explanation of its cure excepting that assigned. He had been in good health all the time, and neither before nor since had he suffered from any indications of nervous exhaustion. He was not overworked, nor subjected to any mental distress. You will see that I have no accurate information as to the degree to which the amblyopia had proceeded, nor excepting from what he remembered as to the exact state of his discs. Still the case fits very closely indeed with the facts with which we have been familiar in a hundred instances of so-called tobacco-amaurosis. I have seen many a patient affected in just the same way improve immediately and permanently on leaving off smoking. But here we are assured there had been no diminution whatever at any time. Let me say here that my patient was a man clearly fond of pictorial effect, and he may have unconsciously exaggerated. It may have been that he did reduce his quantity or quality, it may have been that he indulged to very great excess before the outbreak, or that there was something in the German tobacco which he got which specially poisoned him. I incline, however, rather to the belief that we have here an instance of one drug efficiently counteracting the ill-influence of the other. The opium perhaps relaxed the set of blood-vessels which the tobacco had thrown into spasm. This suggestion is in keeping with what was noted after the champagne dinner.

I have known many cases in which the subjects of smoker's amblopia recovered perfectly although they never left off smoking; and of those who had given it up for a time, I do not know that I ever once witnessed a relapse when the habit was, as it always is, resumed. It may be thought that such facts go against the belief that tobacco has anything to do with it, and that this is made almost a certainty by such a case as that which I have just related. For myself I do not think so. Show me parallel cases occurring in those who do not smoke. It is possible even that one or two of such might be produced, but they are infinitely rare; whilst in heavy smokers, this form of transitory amaurosis is an everyday occurrence. If cases were forthcoming in which there had been no smoking my reasoning would be this—there is probably a form of nerve disorder, perhaps a passing neuritis, perhaps only a vascular ischæmia, which may be induced by exciting causes of the pre-

cise nature of which we know nothing, but concerning which it is still in the highest degree probable that something acts as the predisposing cause. No doubt there is idiosyncrasy in the furthest background; as a middle stage the long-continued habit of smoking, and lastly, some unrecognised influence,—some depression of nervous tissue perhaps,—which determines the attack. The final exciting cause may in some cases be important, and in many it may perhaps be absent, the tobacco being itself sufficient.

You will see that these conjectures open to us a very interesting chapter in reference to the influence of drugs in general, especially of those drugs which we give over long periods of time and of those which become, with many persons, articles of ordinary use quite independent of medical prescription. We do not know but what other articles of which the chief influence is upon the nervous system may after long continuance produce injurious results. We can by no means safely assume that because a nervine stimulant is borne with impunity, or even with apparent advantage, that therefore it is wholly innocuous. It may be that its use involves the risk of very peculiar and wholly unexpected disorders. In the light of this conjecture we ought to examine as to all that is possible in reference to the different kinds of wine, tea, coffee, hops, quinine, absinthe, chamomile, and many others. I shall ask you presently to observe the facts as to the connexion between arsenic and attacks of herpes-zoster, facts which are, let me say, somewhat similar to those in reference to tobacco and attacks of amblyopia. Before proceeding to this subject, I wish to take an illustration from an article which comes into the diet category. The study of drugs is often sufficiently difficult, but that of diet is surrounded by peculiar fallacies. Especially we must remember that both in prescribing and in feeding combination is often everything. A thing which might have agreed well alone, may poison when taken with something else, or conversely, that which alone would certainly have disagreed, may go all right with its proper adjunct. If you put tannin with your tobacco, a man wholly unaccustomed to smoking may take a pipe with impunity. So also camphor counteracts the effect of tobacco, and belladonna prevents the headache from opium. Not only must we keep in mind, in all questions of diet, the possible influence of some unremembered combination, but we must bear in mind that the state of the individual varies at different times. Most of our patients are marvellously unobservant in these matters, or, rather, observe in a hurry, miss out facts, and arrive often very confidently at most erroneous impressions. Sometimes, however, we chance upon an acute and

careful witness as to his own health and the things which help or hurt him. When such is found, prize him and listen in patience to his narrative. I have told you in a former lecture how in respect to "egg poisoning" it is often unsuspected by the patient, and how also in some cases it is only in certain conditions of health and under certain circumstances that eggs do disagree. Now just the same is true of tea and coffee, they will agree under certain conditions, and not under others. The man to whom tea has appeared for years to be an essential of comfortable existence, may suddenly find himself compelled to abstain from it. It may be that slowly this beverage has itself induced a change in the state of the nervous system; but it may also be that some other change in diet has taken place, or perhaps that it is mere result of advance in age.—*Medical Times, Jan.* 12, 1884, *p.* 40.

16.—CHLORAL POISONING TREATED BY BELLADONNA.

By J. MACKENZIE BOOTH, M.A., M.B., Physician to the Aberdeen General Dispensary.

In the treatment of a case with which I had recently to deal, the antagonism of chloral hydrate and belladonna was strikingly manifested. The case was that of an active tradesman of about forty years of age, who for the last ten years has three or four times a year been given to heavy bouts of drunkenness, lasting from a few days to a few weeks, and terminating on most occasions only with the means of obtaining the alcoholic stimulant. At first he only had these bouts after being induced to have a drink with some of his comrades, but latterly, when the craving comes on, as it always does after a few months' abstinence, he begins by consuming the methylated spirit (sometimes fully a pint) which enters into the composition of the varnish employed in his work, and after that is exhausted he drinks whatever alcohol he can obtain. For more than three years I have attended him at these times, and on one occasion, at the end of a week of hard drinking, he got out of bed while unobserved and drank three-quarters of a mixture containing 140 grains of chloral hydrate. Beyond an unusually long and deep sleep, lasting nearly twenty hours, he experienced no ill effects from the drug. About two months ago he again began by having recourse to his methylated spirit, and one afternoon, after a week's drinking, I was called in, and found him with the usual delirium potatorum. I was told that he had had a sleeping draught, obtained at a druggist's, but that it had had no effect in calming him, and that he was breaking everything in the house. A mixture containing two drachms of chloral

hydrate and one of bromide of potassium was ordered, a fourth part of which was to be given at once, and repeated if necessary in half an hour. A few hours after, about midnight, I was again sent for, and found that the patient had obtained the bottle containing the chloral, and had drunk its contents at a draught. He soon fell asleep, and shortly afterwards the pallor and lividity of his face and the faintness of his breathing alarmed the family, so that they again sent for assistance. He was now lying on his back, very still, the face very pallid and slightly blue, the respiration scarcely perceptible save by the slight puffing of his cheeks during expiration, and the pulse very weak, quick, and irregular (120 to 140). Talking to him in a loud voice, touching the conjunctiva, pinching the skin, shaking him, &c., elicited no response. The pupils were in a state of semi-contraction. The profound depression of the respiratory and circulatory centres showed the patient to be in a dangerous condition. Strychnia first suggested itself as the most effective means of restoring the activity of these centres; but tincture of belladonna being at hand, and remembering the effect of belladonna in keeping up the respiration under large doses of morphia, I determined to try it. The patient was accordingly made to swallow nearly a teaspoonful of the tincture in a little water. In a few minutes the respiration became more perceptible, the heart's action more distinct, and the pulse-rate slower and stronger; and in a short time he could be roused by even slight excitation. I then left him, after putting the belladonna out of his reach, and telling his friends to give him twenty drops of it if he showed any sign of relapsing into his former condition. One such dose was given three hours later, when he seemed to be breathing less perceptibly than usual, and the friends said that he flushed up and muttered a good deal after it. Two days' rest in bed and a stomachic tonic set the patient on his legs again.

Belladonna, from its powerful action on the centres of circulation and respiration, has been successfully used in cases of poisoning by aconite and Calabar bean, and by its means the circulation and respiration can be kept up during the exhibition of large doses of morphia or opium without interfering with their anodyne and hypnotic effects. Whether it has been employed in the treatment of chloral poisoning, or whether it has been given along with chloral, as it has with opium where cardiac or pulmonary complications are present, I am not aware, but, to judge from the success which attended its employment in the above instance, I think its administration in such cases worthy of a trial.—*Lancet, March* 15, 1884, *p.* 468.

DISEASES OF THE ORGANS OF CIRCULATION.

17.—CASE OF PURULENT PERICARDITIS TREATED BY PARACENTESIS AND FREE INCISION—RECOVERY.

By SAMUEL WEST, M.D.Oxon., Physician to City of London Hospital for Diseases of the Chest, Victoria Park, &c.

The case may be briefly summarised thus:—A healthy lad of sixteen was suddenly seized with dyspnœa and with pain in the front of his chest. The dyspnœa gradually, in the course of three weeks, became so severe that he was admitted, as an urgent case, into the hospital. On admission he was deeply cyanosed, with considerable dyspnœa, pulsus paradoxus, slight œdema of the feet and of the chest walls over the præcordium, and with all the ordinary physical signs of a large pericardial effusion. The temperature being not raised, it was assumed that the effusion was of some standing, and probably rheumatic in origin. No permanent improvement occurred in spite of copious local bleeding by leeches, and on the sixth day after admission the symptoms became so urgent that paracentesis pericardii was performed, with the result of removing about fourteen ounces of pus. The patient was greatly relieved, the pulse became less paradox, and the physical signs of effusion diminished; three days later the symptoms again became urgent, the effusion had largely increased, and a second paracentesis was performed with the removal of about sixteen ounces of pus. As the pus was slightly fetid it was then decided to make a free incision into the pericardial sac. This was done, using the cannula as a director. A very large amount of pus escaped, and air entered the sac. The operation was not antiseptic, except that all instruments were washed in 1-40 carbolic acid solution, and the cavity syringed out with a solution of the same strength. A drainage tube was inserted, and the wound dressed with oakum and carbolised cotton wool. The pus contained, beyond numerous rod-shaped bacteria, nothing except what would come from an ordinary abscess cavity, namely, shreds of lymph and lumps of curdy pus. The patient was at once relieved, the pulse became regular, and the cyanosis much less. The cavity rapidly contracted, and the discharge diminished. Two days later, under chloroform, the finger was inserted into the sac, and the heart felt beating upon the tip of it above.

A week after the operation the patient had an attack of general urticaria, which lasted for three days. From this time the patient made a rapid and uninterrupted recovery. The cavity contracted, so that at the end of twenty-seven days the tube was removed, and on the

thirtieth day the incision had completely closed. The heart sounds were natural throughout. No murmur or pericardial friction developed. There was no affection of the lungs or pleura beyond some dry pleurisy immediately round the sac. The pulsus paradoxus disappeared, as well as the dyspnœa and the slight œdema of the feet and chest walls. At the end of five weeks after the operation the patient was able to sit up, and from that time rapidly gathered strength. The cardiac dulness for a short time remained almost normal, within the limits to which it had slowly returned, but as the patient began to move about and exert himself, which he was soon able to do without any discomfort, the cardiac dulness slowly increased in size, and on examination, eight weeks after the operation, it extended about half an inch to the right of the sternum, the apex being just outside the nipple line. The patient complained that, if he exerted himself, he felt a little pain occasionally in the left side, near the seat of the scar. As he gathered strength this increase slowly subsided, and two months later the cardiac dulness had returned almost to its normal limits. These alterations in the cardiac dulness are, it appears to me, strongly confirmatory of the diagnosis. The lad grew much in height, and increased considerably in weight during his stay in hospital.

In the absence of the confirmatory evidence of a post-mortem examination, it will be right in a case of such rarity as the present to state the grounds upon which the diagnosis of pus in the pericardium was made. There was evidence of a large effusion of fluid in the anterior and lower part of the thorax. The area of dulness corresponded in position, extent, and shape with those usual in pericardial effusions. There was the usual absence of cardiac impulse, and the heart sounds were extremely weak. There was evidence of great obstruction to the circulation: first, in the enlarged liver, and in the œdema of the feet and chest walls; secondly, in the dyspnœa and cyanosis; and, lastly, in the character of the pulse (pulsus paradoxus). The peculiar, elastic, semi-fluctuating depression in the epigastrium which developed just before the last paracentesis I regard as additional evidence of the effusion having its seat in the pericardium.

The diagnosis was confirmed by the subsequent history of the case:—1. By the great and immediate relief given by the operation of paracentesis and by the subsequent incision; a relief which is, as will be shown later, the especial characteristic of the removal of even small amounts of fluid from the pericardium. 2. By the evidence given by the trocar in the cavity, and by the finger inserted through the incision, for the heart was felt beating upon the end of the trocar and upon the

tip of the finger. 3. By the variations in the cardiac dulness, which were observed during the patient's convalescence.

Two physical signs only are wanting to complete the case clinically, viz., the *bruit de moulin* and pericardial friction. The *bruit de moulin*, or mill-wheel sound, which is met with where air and fluid exist together in the pericardium, is an extremely rare phenomenon. When it occurs it is no doubt pathognomonic of pyo-, or hydro-, pneumo-pericardium, but the converse is probably not true, that it always occurs under these conditions, for the analogous phenomenon in the pleura, viz. succussion, is not invariably present in pyo- or hydro-pneumothorax. The absence of pericardial friction is a greater difficulty, for at no time throughout the illness was undoubted pericardial friction detected. Once only the heart sounds were described as sticky, as they frequently appear to be in rheumatic pericarditis, just before or just after the usual to-and-fro friction. Yet the single fact of the absence of friction is not sufficient to outweigh the concurrent testimony of the other physical signs, for cases of undoubted pericarditis are recorded in which pericardial friction has been absent throughout; and it is stated, although only to be denied, by Bauer in 'Ziemmsen's Encyclopædia,' that in purulent pericarditis friction is usually absent. A case quoted in my table of 80 cases of paracentesis pericardii (Case No. 76) was clinically in most respects similar to this; the pericardial effusion was also purulent, and there was throughout no friction. To the absence of these two physical signs, viz., the *bruit de moulin* and pericardial friction, too much importance, then, must not be attached, for the former is of doubtful value, and the absence of the second admits of explanation.

Clear, however, as the case is clinically, it becomes still clearer, when we consider what other diagnoses were possible. The possible pathological conditions appear to be these:—1. An abscess making its way upwards from below the diaphragm. 2. A localised empyema. 3. A suppurating cyst, or an abscess, in the anterior mediastinum. The first supposition, that of an abscess making its way up from below the diaphragm, from the liver, or from between the liver and diaphragm, may be set aside at once, for there is no evidence to support such a diagnosis. If it were a collection of pus in the anterior mediastinum, we must suppose that it developed immediately in front of the pericardium, in such a way that it pushed both the pericardium and the heart neither up nor down nor outwards, but bodily backwards away from the anterior walls of the chest. This is an almost impossible pathological assumption. Such a collection of pus, not in the pericardium, would be due either to a localised empyema, or to an abscess or suppurating cyst in

the mediastinum. In either case there would certainly have been some dulness posteriorly in consequence of the displacement of the heart, and this there was not. The circumscribed area of dulness corresponding so exactly with that of pericardial effusion would be very remarkable, and it would be difficult to explain the cardiac symptoms. Of empyema there was at no time any other physical signs, and it is difficult to conceive how a cyst or abscess in the mediastinal tissue could have developed in this situation, in the direction of greatest and not of least resistance. It is, I think, almost impossible that a mediastinal cyst should have been limited to this situation. The course of the case, the rapid contraction and closing of the cavity after removal of the fluid, make it clear that the pus was confined in a very resistent and elastic sac, and there are only two conditions which would provide such a sac, viz., a thick-walled mediastinal cyst (of the existence of which there was no other evidence) and an effusion into the pericardium.

When the pleura is obliterated and adherent to the pericardium the operation becomes much simpler. Then a spot may be safely selected as far out as possible, in the nipple line or even further, without any danger of opening the pleura.

Conclusions.—1. Paracentesis pericardii is not only justifiable, but an operation which may be safely undertaken with ordinary precautions. One case only is recorded in which the operation was in itself fatal. With this exception all the patients were greatly relieved by the removal even of a small amount of fluid, and many recovered completely, who would probably have died if the operation had not been performed.

2. The most suitable place for puncture is, in ordinary cases, in the fifth left intercostal space one inch from the edge of the sternum, but if the pleura be adherent, the puncture may be made safely much further out, and even in the sixth space.

3. The instrument employed should be a trocar and cannula, with or without aspiration.

4. The operation may be performed with advantage not only in the pericardial effusions of rheumatic or primary origin, but also in those which occur in the later stages of general dropsy, if it should appear that the fluid in the pericardium is adding to the difficulties under which the heart is placed.

5. Purulent pericarditis is best treated on general principles, like an empyema. *a.* The pericardial sac may in these cases be safely opened and drained. *b.* This treatment moreover appears to be the only one which offers the slightest hope of recovery. *c.* The results are likely to be more favourable than those of empyema, for the walls of the cavity are better able to contract rapidly and thus permit of complete obliteration.—*Medico-Chirurgical Transactions, vol.* 66, 1883, *p.* 235.

18.—IDIOPATHIC (PROGRESSIVE PERNICIOUS) ANÆMIA, AND ITS SUCCESSFUL TREATMENT BY ARSENIC.

By GEORGE PADLEY, L.R.C.P.Lond., Consulting Physician to the Swansea Hospital.

[After detailing the history, symptoms, and minor points of treatment of a severe and typical case of this malady, one which a few years ago would have been looked upon as hopeless, Dr. Padley says :]

I prescribed my patient two minims of arsenical solution thrice daily, increased at short intervals to four minims. This he took punctually, and in less than a fortnight showed signs of amendment. In my report on March 13th—*i.e.*, three weeks after first taking the medicine, I find the following items :—"Still improving; pulse stronger, less compressible; tinge of red returning in the lips; waxy pallor less marked; 'thumping of the heart' much less; continues to take food better; enjoys his mutton chop; less breathlessness, able to walk upstairs quietly without discomfort; sleeps well; goes out daily for a drive or short walk in the garden, weather permitting; urine, sp. gr. 1021, rather high-coloured, no bile or albumen; microscopic characters of blood decidedly improved. The rest is but a record of progressive advance towards recovery, interrupted occasionally in minor particulars. In a fortnight after the commencement of the treatment by arsenic, even in the small doses at first given, the patient showed symptoms of amendment, and in less than a month the icteroid pallor had given place to a tinge of red in the cheeks, and a more decided restoration of colour to the lips, &c., greater capability of exertion, less breathlessness—in short, a marked subsidence of all the symptoms.

As far as I can discover, Dr. Byrom Bramwell was the first, in 1877, successfully to employ this agent in the disease, having found other treatment, including iron in various forms and doses, entirely fail to produce any good effect—the latter, indeed, often doing apparent injury. He was shortly followed by Dr. Finny of Dublin, who, having like others failed with iron, &c., was induced to give arsenic from its known action in cardiac anæmia, leukæmia, &c., not being aware at the time of Dr. Bramwell's successful trials. The summary of six cases treated by Dr. Bramwell is as follows:—Three were cured under arsenic; iron and quinine previously tried and failed. One was cured while taking carbonate of iron; arsenic previously taken. Two died after treatment by iron and quinine; arsenic not given. Dr. Finny has published three well-marked cases of the disease, in which two out of three cases recovered under arsenic, the third succumbing to an exhausting complication.

Three distinct cases of the disease are reported by Dr. Lockie. Two of them got well under arsenic—one in about three months, the other in two months, and the third "gradually and steadily improved." All had taken iron in various forms, also nux vomica and phosphorus, without relief. The last was benefited by mineral acid and pepsine after ligature of piles.

An interesting case is also published by Dr. Broadbent, in which the patient had been in the infirmary for six weeks without benefit. As he "had no doubt taken already quantities of iron, which in these cases was of little use," he was ordered two minims of Fowler's solution and seven minims of tincture of digitalis, three times a day. During the progress of the case the arsenic was increased gradually up to four minims six times a day, the digitalis omitted. He steadily improved, and in a week later was discharged cured. "The failure of iron to do good, and the rapid improvement during the administration of arsenic, were remarkable." In little more than two months the patient passed from extreme anæmia to apparently perfect health, and was well and strong for some months after, while under observation.

I will mention one more case, which occurred in the practice of Dr. Withers-Moore, one of profound anæmia and prostration, in which for the first three months iron was tried in various forms without any benefit whatever. For the last two months three minims of Fowler's solution were given thrice daily, and she left convalescent. She had occasional hyperpyrexia, for which quinine was given with advantage.

With this mass of evidence of the undoubted power possessed by this agent in controlling and subduing this disease and restoring the subjects of it to health, whatever the source and explanation of this power may be, it is surprising to find how little its value and importance are realised or appreciated at the present time. A recent case is published in which "the treatment hitherto had been iron and nutritious diet," with the usual sequel, "the patient's condition having steadily become worse," and, in spite of transfusion and a consequent increase of corpuscular percentage in the blood, death. Arsenic was not tried.

As a remedy for this hitherto and, with other treatment, fatal disease, this medicine (arsenic) is either altogether ignored, or but cursorily noticed, in nearly all our best and most recent treatises on medicine and therapeutics. That it is so is apparent from the following references and quotations with regard to prognosis and treatment. In our latest compendium of medical science, the Dictionary of Medicine, 1882, edited by Dr. Quain, under "Progressive Pernicious Anæmia" the entire subject of treatment is disposed of in the following sentence: "Treatment

must be ordered on general principles; transfusion has been frequently tried, but without success." This comprises the whole of the information given under this head. In the same article it is said "the course of the disease is steadily towards death, in which it generally terminates." It is also spoken of as a malady "which attracts attention by its resistance to treatment, and its fatal termination," and one "the prognosis of which is as unfavourable as possible." In Dr. F. Roberts' Handbook of Medicine, 1880, the treatment is thus given: "In idiopathic, and still more in pernicious, anæmia, remedies have little or no effect. Transfusion has been performed in many instances, but without success." Not having seen the last edition of this work, just published, I cannot say whether the above has been added to or modified. Aitken (Science and Practice of Medicine, 1880) entirely ignores the treatment of this disease, and refers to it as "a form of chlorosis described by Lebert under the name of essential or idiopathic anæmia, particularly in pregnant women." Bristowe (1882) speaks of two forms of anæmia, one chlorosis; "the other arising under other conditions, almost always fatal, and described as idiopathic," &c. The latter is characterised, among other things, "by its almost invariably fatal result, usually in from six to twelve months." After describing the treatment of chlorosis by iron, &c., the following sentence occurs: "In so-called pernicious anæmia all the usual remedies appear to fail," and this is all that is said about it. The use of arsenic is not noticed. The directions for treatment in Dr. Austin Flint's Principles and Practice of Medicine, 1881, are equally unsatisfactory. Its objects and general principles are said to be sufficiently obvious—viz., "the removal of all causes which may have produced the disease or which render it progressive, and the substitution for these causes of all agents and influences which affect favourably the functions concerned in assimilation and nutrition." "The same principles are involved as in the treatment of anæmia in all the grave diseases affecting the hæmatopoietic system." Transfusion of blood is alluded to as "an extreme measure, thus far without encouragement to expect from it more than a temporary advantage." This includes a summary of all that is said about treatment. Bartholow (Practice of Medicine, 1881), in his definition, describes the disease as "a form of anæmia, progressive and fatal," and also applies to it the term "malignant." Again: "Prognosis highly unfavourable, *no cases of cure having been reported.*" "Anæmic symptoms require iron, but if hemorrhages are occurring it must be discontinued," and arsenic is spoken of in the same category with ergot and quinine, as that which may be substituted. "Unfortunately, thus far no results have fol-

lowed the treatment, and the cases have pursued their evil course until the end." In 1882, however, in his Therapeutics, he speaks favourably of arsenic in chlorosis and anæmia, but idiopathic anæmia, as a distinct affection, is not here recognised. In the same strain as the foregoing writes Dr. Immerman in his elaborate article in Ziemssen's Cyclopædia, where he "insists on the inefficacy of every kind of treatment, regarding every case as tending inevitably to a lethal issue," and where with a "strengthening dietary reliance is to be placed on large doses of wine, iron, quinine, &c., and, above all, transfusion;" but that not one of these "appears capable of appreciably delaying the fatal issue. Indeed, the absolute fruitlessness of all tonic treatment, and the uninterrupted progress of the disease towards death, are the essential characters of this peculiar affection. The name given to it by Biermer would cease to be applicable were our therapeutic efforts capable of achieving any measure of success." In a supplement, however, to this work, edited by Dr. Peabody, (1881), arsenic combined with iron is spoken of with some encouragement, and, from reports, as deserving of repeated trials. Lastly, Niemeyer (1881) says: "Treatment has proved unsatisfactory; even the cases ending in recovery seem to have done so spontaneously. We can do little more than remove injurious influences, and give good diet, air, and tonics, especially iron." It is also said: "In some of these forms of anæmia arsenic by the mouth or subcutaneously is reputed to be very efficacious; but it has not yet been sufficiently tried to enable us to say in which cases it will do good and in which it will fail." In nearly all our best authorities on therapeutics we find the same silence with regard to the use of arsenic in this disease: such as Ringer, 1882; Farquharson, 1883; Garrod, 1882; H. C. Wood, 1880; unless the statement by the latter that "it is useful in anæmia when that is a prominent condition in chronic malarial dyscrasia" may be taken to mean this. The only treatise in which I can find anything like a due recognition of the value of this medicine is in Phillips' Materia Medica and Therapeutics, 1882, where he refers to several cases in which it was successful, having previously spoken of the disease as one that "has usually ended fatally by exhaustion and collapse in spite of iron, food, &c."

Such, then, being the general view taken by the profession with regard to the fatality of the malady and the uselessness of treatment, as reflected in our best literature, it is time, I think, that those who, like myself, may in the course of their practice be brought into contact with it, and may seek, and seek in vain, for counsel to guide them in the pages of our most recent and approved authorities, should have placed prominently

before them the only treatment as yet attended by a fair degree of success, and their despair converted into a reasonable amount of hope. That such hope would not be unfounded will, I believe, be seen from the data I have brought forward, and from the following summary which I have drawn up from such data, and which, I think, would justify us in saying that the "name given to the disease by Biermer" *does* "now cease to be applicable."

Of forty-eight cases treated without arsenic, or treatment not recorded, forty-two were fatal, two under treatment (getting worse), three result not known, one recovered (clearly a case of leukæmia); authorities—Hobson, Coupland, Mackenzie, Bramwell, and Barclay. Of twenty-two cases treated by arsenic, sixteen recovered, two improved, and four proved fatal; authorities—Hobson, Coupland, Bramwell, Finny, Broadbent, Withers-Moore, Lockie, and Padley. In the whole list there is not, with one exception, a single authentic case of recovery in which arsenic did not form a chief part of the treatment; and in the exceptional case arsenic was first given and carbonate of iron followed. As Dr. Hobson's collection evidently includes most of the cases given in Dr. Taylor's paper, and probably some in Dr. Pye-Smith's *résumé*, as well as some cases published by Dr. Wilks in Guy's Hospital Reports, I have excluded these. It is also possible that there may be some other cases of repetition from a similar cause, but this would not affect the general conclusion. I may here refer to a case reported as one of "pernicious anæmia," in which recovery took place after the administration of a pill containing morphia, creasote, and nux vomica, followed by citrate of iron and quinine and cod-liver oil. There is nothing, however, by which to identify this case as one of the disease in question, and the description generally does not accord with our conception of it. It was thought to be a case of malignant disease until a gain of sixteen pounds in fourteen days followed by recovery disproved this idea. A simple anæmic state dependent on some gastric disorder would, I think, have been the more correct diagnosis in this case.

I did not intend in this paper to touch upon any pathological question, but I could not help being struck with the marked discrepancy existing between the influence upon the blood of arsenic when taken in a state of health, or its physiological action, and when administered in the disease under consideration, its therapeutical action. I mean the diminution of the red blood-corpuscles in the former case, and their increase, as well as improvement, in the latter. Thus Phillips quotes the case of a gentleman suffering from cerebral congestion, the result of plethora, who was relieved by arsenical treatment, which materially reduced the amount of blood-clot and the

number of corpuscles; and he adduces other instances. This, among other things, would seem to point to the primary influence of the medicine being exercised upon the ganglionic nervous system, in favour of which there is certainly much to be said.

The chief practical conclusions to be drawn from what has been here advanced are:—That in arsenic we have a medicine exercising what may almost be termed a specific action in "idiopathic anæmia;" that in a clearly recognised case it is useless, and worse than useless, pouring in iron, and, unless as auxiliaries, other tonics; that arsenic appears to act best in its simple and uncombined form, and that its action is rather interfered with than otherwise by combination with iron; that the failure of iron—so potent in other forms of anæmia—serves as a kind of therapeutic diagnostic between these and idiopathic anæmia; and that the prognosis and directions for treatment of our chief authorities on medicine and therapeutics are, I say it with all deference, misleading and unduly discouraging, inasmuch as they are either altogether silent upon, or enumerate cursorily with other medicines, the only agent which appears to have exercised a real and essential influence upon the disease, and which has undoubtedly been the means of rescuing a large proportion of sufferers from its otherwise deadly power.

As an addendum to this paper, I may state that I have since heard twice from my patient—the last time about ten days ago, that is about seven months from the time of my first seeing him,—and that he has continued to progress favourably in all respects.—*Lancet, Nov.* 10 and 17, 1883, *pp.* 811, 850.

19.—ON A CASE OF ANGINA PECTORIS TREATED WITH NITRITE OF SODIUM.

By W. Collier, M.A., M.B.Cantab., House Physician to the Wolverhampton and Staffordshire Hospital.

George H., aged forty-eight, became an out-patient on Aug. 29th last, when the following notes were taken. The patient is a foreman at a sheet-iron rolling foundry. His illness commenced about eighteen months ago with an acute attack of bronchitis; on recovering from which he was troubled with attacks of shortness of breath and pain over the cardiac region on exertion. After a few months he got much better, and continued so until the early part of Jan. 1883, when he first began to suffer from attacks of severe pain in the region of the lower third of the sternum, attended by profuse cold sweats and extreme dyspnœa. These attacks were brought on by sudden exposure to the cold air or any unusual exertion, and generally lasted from ten to fifteen minutes; and they have

gradually increased in duration and severity, so that at times lately he has been obliged to stand, when seized with the pain, from twenty to twenty-five minutes without moving. During the last two months his legs and ankles have swollen. Until the present illness he had enjoyed very good health. From nine years old until twenty-eight he worked as a shingler, a very laborious occupation. His condition was as follows:—Sallow complexion; lips somewhat cyanosed; pulse small and collapsing; dyspnœa marked; slight œdema of legs and feet; carotid and episternal pulsation visible though not marked; heart's apex beat in seventh interspace one inch to the left of the left nipple; area of dulness extends laterally from the mid-sternal line to an inch and a half beyond the left nipple line: double murmur at base, and soft systolic at apex. During the months of September and early part of October, the patient's general condition was greatly improved by the use of digitalis, iron, and sulphuric ether, but the anginal attacks were not in the slightest degree relieved.

On Oct. 15th the patient was ordered three-grain doses of nitrite of sodium, a dose to be taken about ten minutes before doing anything likely to bring on an attack. On the 18th the following note was made:—Since the 15th has taken four or five doses daily; the attacks occur as usual, but are very much shorter and less severe. Now walks home from the iron foundry in about twenty minutes, formerly it used to take him about three quarters of an hour, at times considerably over the hour. Dose of nitrite of sodium increased to five grains.—21st: Caught cold on 18th and is not so well; œdema of legs and dyspnœa much increased; has had no digitalis for the last day or two. Anginal attacks still always markedly relieved by the nitrite.

Nov. 7th: Has been confined to bed for the last few days with an acute attack of bronchitis. Is still taking five-grain doses of the nitrite two or three times daily, and finds great relief from its use.

Remarks.—It will be noticed that during the first six weeks of the patient's attendance at the hospital his general symptoms of dyspnœa and œdema were greatly relieved by the digitalis, but the anginal attacks were in no way mitigated until after his first dose of nitrite of sodium. Unfortunately the patient would not consent to become an in-patient, and as, after taking the drug for two weeks, he could not attend as an out-patient, owing to an acute attack of bronchitis, it was not deemed advisable to increase the dose beyond five grains, otherwise we have every reason to believe that the attacks would have still further yielded to the nitrite of sodium, more especially as the specimen used most probably was adulterated with the nitrate,

the writer having himself taken an eight-grain dose without experiencing any disagreeable effects, beyond a feeling for a few hours of fulness and flushing about the head and eyes. Dr. Hay relates a case of angina, very similar to the present (*Retrospect*, vol. 87, p. 161), in which nitrite of amyl and nitrite of sodium were in turn tried, the opinion formed being that the influence of nitrite of sodium and its power of mitigating an attack extended over a much longer period than was the case when nitrite of amyl was used, though it was observed that the effects of the nitrite of sodium were much longer in developing; hence the necessity of taking it some time from ten minutes to half an hour before an expected attack. In this paper Dr. Hay claims that in therapeutic doses nitrite of sodium, while producing all the beneficial effects of nitrite of amyl, does not produce the disagreeable general effects of nitrite of amyl—headache, giddiness, &c. There is one other great advantage, its cheapness, as Professor Balfour has shown that only a freshly prepared specimen of nitrite of amyl, or one that has been kept in an hermetically sealed capsule, is trustworthy, as an old specimen, though it may produce all the usual symptoms of the drug—flushing of the face—will often not relieve the angina, which will at once give way to a newly prepared specimen. Now an ordinary dose of nitrite of sodium would cost considerably less than one halfpenny, while the nitrite of amyl capsules cost between 3d. and 4d., the latter being quite beyond the reach of out-patients, who in many cases would require from six to ten per diem.—*Lancet*, *Nov.* 24, 1883, *p.* 901.

DISEASES OF THE ORGANS OF RESPIRATION.

20.—RAPID ABSORPTION OF PLEURITIC EFFUSION BY USE OF SALT AND CUTTING-OFF LIQUIDS.

By Tom Robinson, M.D.

John C. came under my observation on August 1st, 1882. He was then suffering from a well-marked left pleurisy, *i.e.* pain, catching breathing, and a cry at the end of inspiration. He sat up in bed and held his hand against his side, complaining bitterly of the pain. A bandage was put firmly round the thorax, with much and rapid relief, and he was ordered absolute rest, a liquid diet, and some opium. On August 2nd he was evidently much relieved, and his respiration was more uniform, deeper, and attended with less pain.

On August 3rd I was hastily sent for, and, on my arrival, I found my patient in great and urgent distress. His lips were livid, his nostrils were smoky, his eyes were prominent, and his nails blue. He had cold clamminess of hands and brow, and

he was breathing fifty-one times in a minute. The pulse was barely appreciable at his wrist. The heart was pushed over to the right. I told him of his great danger, and urged him to permit me to draw off the fluid. This he flatly refused to allow me to do, saying that a friend of his was tapped, and died one hour afterwards. This was at 11 a.m. I put him under the following conditions. He was to take every hour one tea-spoonful of common salt, dissolved in a wine-glassful of tepid water. I produced sweating by a hot wet flannel and a piece of waterproof sheeting, and I gave him two ounces of the common black draught at once, and stopped all fluids. At 1 p.m. he said: "I can get my wind now," and he had most markedly improved in every way. He looked less livid. His respiration had dropped down to 48. At 9 p.m. he looked cheerful. The lividity had almost disappeared. He could lie on either side, and get well down in the bed.

On August 4th, on entering the room, I could not have detected any embarrassment of breathing, and all his subjective symptoms had disappeared. There was comparative dulness of the left base, but the air could be heard entering the lung. I now gave him one drachm of common salt twice a day, and two ounces of the brandy-mixture of the *Pharmacopœia* every four hours, together with some oysters and anchovy and Digby chick, or a piece of salted bacon. He did not complain very much of the thirst, said his "mouth was dry," and his tongue looked red and glazed. From this time there is practically nothing to say, my patient never had a return of his symptoms, and he was up and out of doors in a week.

It is barely necessary to comment upon the *rationale* of the treatment adopted in this case, and my only object in bringing it forward is to see whether like results will follow in the experience of other similar cases, or in any effusion which takes place into a serous cavity. The salt, I believe, increased the density of the blood; the blood became thirsty, if I may so express it, and drank up the pleuritic effusion in a manner to me singularly rapid and striking. Doubtless the sweating and purging aided me very much; but purging and sweating will not remove serous effusions with precision. — *British Medical Journal, Dec.* 22, 1883, *p.* 1234.

21.—ON AN ADVANCED CASE OF PHTHISIS TREATED BY ANTISEPTIC INHALATIONS.

By I. Burney Yeo, M.D., Physician to King's Coll. Hospital.

The patient was a girl fifteen years of age. Her personal appearance was that of what I have been accustomed to call the "refined" type of phthisis, in contradistinction to a more

common type, the "coarse" type. I have again and again pointed out to you the frequency of the latter type; enormous projecting ears, coarse large features, abundant coarse hair, and not very shapely limbs, large hands and feet. This girl was of slight build, delicate refined features, small ears, large dark grey eyes, long eyelashes, small hands with rather long tapering fingers and filbert nails. Her family history was significant; she had lost her father at thirty-two years of age of phthisis, and she had lost three brothers and one sister of the same disease. She had been complaining of a cough for two years, and had been losing flesh for a year. On her admission she was very ill, and complained of constant cough, dyspnœa, emaciation, loss of appetite, and night-sweats. Evening temperature 102°; morning, 99°. Rapid pulse and respirations; tongue coated. She was suffering also from diarrhœa.

Physical examination revealed the existence of extensive infiltration and disorganisation of both lungs. On the right side, there was dulness in front to the lower border of the third rib, with moist clicks at the end of inspiration, and tubular respiration over the whole of the upper lobe behind. On the left side the disease was much more advanced. There was dulness all over the upper lobe in front, with cavernous respiration, and moist gurgling *râles*. Behind, there were cavernous breathing and gurgling above the spine of the scapula, and blowing respiration and crepitant *râles* all over the lower part of the lung.

The treatment consisted in the almost continuous use of an inhalation, at first, of eucalyptol and spirits of chloroform, subsequently of creasote and spirits of chloroform. She also had a mixture containing two minims of creasote, and two grains of quinine, with glycerine and mucilage three times a day. After about three weeks in the hospital, the improvement in her symptoms and general condition was remarkable, while the physical signs remained much the same. The night-sweats had disappeared, the appetite was completely restored, the bowels were quiet, and the cough very much better. After a few more weeks of this treatment, she felt so well, that she begged to be allowed to return to her home, which was a comfortable one. Now, I do not think any one, nurses, as well as doctors, who saw this girl when she came into the hospital, thought she would leave it alive. She appeared to be sinking from rapidly advancing disorganisation of the lungs, and attendant constitutional disturbances. The effect of the antiseptic treatment in this case was not to cure the disease, or to restore the destroyed and broken down lung-tissue. To perform what, to our constant experience, seems impossible, is to perform a miracle, and we do not claim miraculous virtues

for antiseptic inhalations. But what I claim for them, in this case, is, that they not only prolonged life, but that they quieted, in a remarkable way, the often most distressing advanced stage of this malady. By allaying all the most distressing symptoms, this patient's condition, which at the beginning of the treatment was a very miserable one, became a comfortable one. You might have seen her going about the ward quite cheerful and happy. Now, this quieting, ameliorating effect of antiseptic inhalations in advanced stages of this malady has been noticed by many observers, and it is largely dwelt upon by Prof. Oertel in his recent work on Respiratory Therapeutics.

Two objections have been made to the use of antiseptic inhalations, which are in singular opposition one to the other. The first is, that the vapours given off from the fluid which we drop on the sponge of the respirator are so strong and irritating, that they excite inflammation of the pulmonary tissues, and thus do injury; indeed, I have seen the antiseptic treatment of phthisis referred to in a medical journal as "homicidal." The other objection does not accuse of homicide, but is content with pointing out that we are very foolish people to imagine that any useful or appreciable amount of our antiseptic substances reaches the lung at all! I do not know which of these objections is least in accordance with experience.

With regard to the first objection, I can state most positively that I have never seen any symptoms of irritation set up by antiseptic inhalations when properly applied. With sensitive persons, it is desirable to begin by at first dropping a very few drops of the inhalent on to the sponge, and slowly increasing the quantity; by that means, you will avoid all risk of irritation. The second objection scarcely needs answering at all; to some extent, it is a resurrection of the old dispute as to the use of topical remedies (in the form of vapours and sprays) to the respiratory surface, which was agitated fiercely many years ago, and the affirmative view thoroughly established by most elaborate and careful experiments by a number of observers in every country in Europe. The dispute and its results are fully related by Oertel in the work already referred to, and also by Dr. Solis Cohen of Philadelphia, in his work on Inhalations. I thought it had been pretty generally known that, by the combined use of dry inhalations and inhalations of the steam-spray, symptoms of carbolic acid intoxication had been produced. But there is an irritation in the minds of some with regard to the use of these inhalations, which it is difficult to understand. I hear of patients being "forbidden" to use them! Another curious circumstance is that this "irritation" only refers to their use in phthisis. I have never heard any

one dispute their value, their very great value, in cases of putrid bronchitis, bronchorrhœa, and bronchiectatic dilatation. Now, in cases of advanced phthisis, there are many conditions existing in the lungs and air-passages absolutely identical with those that occur in the diseases I have just named, and for the control of which antiseptic inhalations afford the most reliable therapeutic resource. Let me advise you to keep your minds free from prejudice in such matters; and, when you hear any method of treatment, which has been tested by experience, assailed by arguments which are absolutely inconsistent with one another, let me, slightly altering the scriptural injunction, say, "Go thou and do *otherwise*."—*British Medical Journal, Jan.* 12, 1884, *p.* 44.

22.—ON ANTISEPTIC INHALATIONS IN TUBERCULOSIS. By SOLOMON C. SMITH, M.D., Surgeon to the Halifax Infirmary.

To kill bacteria is one thing, to kill germs is quite another. It has been proved that they can stand a short boiling, that they can be floated in air-bubbles through strong vitriol, that they can be washed with carbolic solution of any strength short of 5 per cent., without being killed, or losing their power of self-multiplication. Is it likely, then, that any vapour which could possibly be inhaled would be capable of destroying organisms which are so retentive of their vitality? I think it is quite obvious that all evidence shows that it is impossible, either to keep germs out of the body, or by antiseptics to kill them. What else, then, can inhalations do?

Several years ago, Prof. Tyndall made a discovery which has an important bearing on this subject. While he was performing a series of experiments on the living matter in the atmosphere, it became necessary very frequently to prepare sterile solutions, and he was much troubled by the prolonged boiling which was necessary to destroy with any certainty their contained vitality. But he found that if, instead of giving his solutions one long boil, he heated them several times for quite a short period, leaving them at the ordinary temperature in the intervals, he could quite readily devitalise them. This method he described as sterilisation by discontinuous heating. He discovered, in fact, that, however hard and resisting the germ may be, there is, in the life-history of every bacterium, a period when it is very soft, tender, and easily destroyed; and that, although he could not touch the germs themselves, he could let them hatch, and, by repeated slight heatings, kill their offspring as they came out, while they were too young to produce a fresh generation; and thus he was able, without ever reaching the point of ebullition, completely to devitalise the fluids

which he had found most resisting, even to very prolonged boiling. The recognition of this difference between germs and bacteria, as regards the action of destructive agents, explains many things otherwise difficult of comprehension, and enables one to understand how organic substances can often be protected from decomposition by the addition of very minute quantities of antiseptics, in proportions quite too small to be in any way considered germicidal.

The *modus operandi* is probably in all cases the same: the germ is allowed to hatch, the young is killed by an antiseptic far too weak to touch its parent, and thus the race dies out. Now, it seems to me that this is the explanation of the action of antiseptic inhalations. The materials which have been found most useful are not mere gases which intermingle with the inspired air and then pass out again with it, but are vapours, gaseous forms of soluble bodies which are deposited wherever their penetrating vapour comes into contact with water. On every moist bronchial tube, on the walls of every cavity, and even in every congested spot in the lung, the inhaled carbolic vapour condenses and carbolises the tissues; and we are, I think, forced to believe that the benefits derived from the use of antiseptic inhalations are due to this infiltration of the lungs with antiseptic material rather than to any action upon the floating germs. It must, however, be granted at once that this impregnation of the tissues never goes to any great extent, and the question arises whether so mild a dose can have any effect in preventing bacterial growth. There is plenty of evidence to show that antiseptic inhalations diminish the irritating qualities of the expectoration, and lessen the number of bacteria in it; but there is no proof at all that it can be rendered entirely free from bacteria by any amount of antiseptic vapour; in fact, all evidence goes the other way.

Now, it has often been assumed that, if we cannot stop the growth of micro-organism in fluids lying in the tubes and cavities, we certainly must not expect to check their development when embedded in the substance of the lung. But the cases are different; the one is a question of dead matter, the other of living tissue. Decomposition of expectoration obeys the same laws as experiments in test-tubes; but the growth of bacilli in the living substance of the lung is resisted by the vitality of the tissues themselves. Life is the great antiseptic. There are few points in which the difference between things living and things dead is more markedly shown than in the power live bodies possess of resisting, by virtue of their own vitality, the growth within themselves of those lower organic forms which, in dead tissues, readily take root and grow, and, by their development, rapidly reduce the lifeless elements to

their lowest chemical affinities. For scores of years man's body resists decay, and then, when life departs, he rapidly swarms with myriads of bacteria; not that there is any chemical change making his body more suitable food for them, but because they are able at last to take possession, now that the resisting power of his vitality has departed.

As it is with the germs of decomposition, so it is with those of tuberculosis. When they attack the lung, they do not usually at first affect those parts which are most actively performing their functions; the very parts into which they are most freely carried by the air are least susceptible to their attacks; their active vitality is their protection; but, in the apices and parts injured by previous inflammations, they settle and breed disease. And, even when phthisis is well established, and when the air in the chest must be crowded with its germs, large portions of the lung remain for long untouched; showing, on the one hand, how great is the resistance to the disease inherent in the tissues themselves, and, on the other, giving a rough measure of the amount of help required from treatment. For, if the difference between a soil fit and one unfit for bacterial growth is to be measured, for example, by the difference between the functional activity and resulting vital resistance of an upper and a lower lobe of the lung, surely it is not unreasonable to hope that, by impregnating the pulmonary tissues with antiseptic material, which, we know, renders them less fitted for the cultivation of bacilli, we may be able to make up the lacking resistance, and so prevent the access of disease.

When we send a patient to Davos, to an atmosphere so rare that he has constantly to use the whole of his lung to get sufficient breath, instead of breathing with a portion only, as we mostly do, we really give to the whole lung the same functional activity, the same resisting power, which formerly belonged only to certain parts of it, and we know that the disease is often checked. If, then, the tissues are so nearly able to hold their own, it ought to be possible, by adding the resistance of any antiseptic, to stop the progress of a disease which, according to the premises of our argument, is due to bacterial growth. This may all be mere theorising, but it leads to some very practical points.

First, the material used ought to be capable of absorption by moist surfaces; it should be a vapour, not a gas; and a dry vapour, not an atomised solution. Second, as no attempt to filter or sterilise the air is required, all complex forms of respirator may be discarded. The freest possible access of air should be allowed, the vapour being breathed with it as constantly as possible; so that the simplest and most open respirator is often the best, the mere diffusion of the vapour in

the room sometimes being sufficient. Thirdly, we must combine with the treatment by inhalation, all medicinal, dietetic, and hygienic measures which tend to improve the general condition of the patient, and thus increase his vital resistance.

It is worth bearing in mind that the view of the matter, which I have so imperfectly brought before your notice, shows the harmony and unity of purpose which exists among the various means which we make use of in the treatment of consumption. If we accept the germ-theory of the origin of tuberculosis, all treatment, both local and general alike, must aim at preventing the growth of certain bacteria in the body; the struggle is between one great life and myriads of small ones; and while all general treatment tries, by providing healthy work, good food, and pure air, and by attention to all secretions, to improve man's condition, and make him so suitable to his surroundings, that he, being the fittest, shall survive; local treatment, on the other hand, endeavours to impregnate the lungs with substances so inimical to the development of microscopic forms of life, that the parasite, planted in a soil unsuited for it, beaten in the struggle, shall cease to grow.—*British Medical Journal, Feb.* 23, 1884, *p.* 353.

23.—ON THE TREATMENT OF PHTHISIS.

By W. R. Thomas, M.D., M.R.C.P., Physician to the Sheffield Public Hospital and Dispensary.

My treatment to a certain extent has depended upon the class or variety to which I believed the special case belonged, and I have been able to throw aside some medicines which I have hitherto considered indispensable in all cases of phthisis. These varieties are: 1. Those dependent upon the inhalations of particles which act as irritants upon the delicate membrane lining the tubes and ultimate air-cells of the lungs, and give rise to the presence of new material in the substance tubes, and air-cells, of the same, which is apt to undergo caseation and disintegration, and cause the formation of a vomica, the fever being dependent upon the local mischief originally; 2. Those dependent upon the non-disappearance of the products of inflammation, as after pneumonia, typhoid fever, and other diseases apt to be accompanied by pneumonia; 3. Those cases in which there is a distinct hereditary tendency to the disease.

Grinders, colliers, flax-dressers, stone-masons, and others, who, when following their daily occupations, are constantly inhaling particles of different materials, and also those who live in manufacturing or crowded districts, generally suffer from the first variety; and I have been astonished at the success of treatment in such cases, when the patient has been able

to follow it up in its entirety. When there are distinct signs and symptoms of incipient phthisis, and where the cause of the disease, *i.e.*, local irritation, is evident, it is a sure proof to us that the lungs will not permit such irritation without rebelling; and I think that we shall be taking the bull by the horns, and performing an act of justice to the patient, if we tell him or her that, if life is to be saved, the occupation must be given up, or that, when living in an atmosphere of dirt, removal is quite necessary. It is often difficult, perhaps impossible, for the patient to follow the advice of the medical men; as, if a man, he may have a wife and family dependent upon him, and may not, perhaps, be able to earn one-fourth of his salary at any other trade; but I know I have seen some scores of good examples of real cure of phthisis in the first and second stages, and of partial cure in the third, when I feel positive that it has depended upon the removal of the cause, and that, without such removal, treatment would have been of little avail. I speak strongly on the subject, because I see clearly men and women courting death by living in such an atmosphere, and think, perhaps, that we are not positive enough in giving out directions.

In the treatment of this variety, as of the other two, of this complaint, it is very necessary that strict directions should be given as to matters which the patient is too apt to look upon as not of great importance, viz.—exercise, ventilation, sponging, and diet.—The patient should have out-door exercise daily whenever the weather is favourable, both in winter and in summer, the amount depending upon the strength of the patient.—Sponging of a part, or the whole of the body, every morning rapidly in incipient cases, where the patient can bear it, is very useful, and, I believe, renders him or her less liable to, so frequently, catch cold.—As to diet, I find that female hospital patients almost live on tea and bread and butter, but very little of the latter. They have tea for breakfast, tea for dinner, tea for tea, and tea for every meal. I invariably stop this, and find that, when they take proper food, as bread, milk, meat, &c., properly chosen by the medical man, according to the powers of digestion of the stomach, improvement rapidly takes place.—As far as my experience goes, but little attention has hitherto been paid by architects to ventilation, especially when superintending the erection of cottage-houses. The atmosphere of the patient's room is often abominable, and loaded with all sorts of impurities, exhalations from the lungs and skin of the patient and friends, impure gases from gas-burning, which cannot fail to have an injurious influence upon the patient's health. I am in favour of having plenty of fresh air in the room by opening the window if necessary, and yet

avoiding a draught; but in this, of course, one is guided by the state of the weather.—If the appetite fail, I know of no better tonic than gentian. Quinine in this complaint is a most valuable remedy; it certainly acts as a general and stomachic tonic, tends to check the fever, prevents waste, and checks the sweating better than any remedy I know.

How often we do meet with cases of the second variety in patients who tell us that they never have recovered since they had inflammation of the lungs, or some other acute disease, some months ago! Here we have not any irritant passing into the lung, but the presence of something in the lung and a general cachectic state of body to grapple with. I have seen many cases of this kind during the last few years, and many have recovered under the following treatment. I have applied a good large blister over the part affected, administered chlorate of potash and bark internally, and given strict directions as to amount of exercise to be taken, ventilation, sponging, and diet; as in the preceding variety; and in many cases the patient has seemed to have been invigorated by the treatment, and the disease has disappeared. Frequently I have seen a wonderful change has taken place as soon as the patient, if living in a town, has been removed to a part where the atmosphere is clear, and the weather permits, even in winter, the patient to go out daily. Unless, by recommending change again, exercise, and by attention to the details mentioned in the treatment of the first variety, an impetus can be given to increased nutrition, and that soon, there is danger of disintegration. These patients feel so depressed and disinclined for exertion, that we often have to use our best persuasive powers, and often are rewarded by success. The remedies mentioned before I have found valuable in these cases.

The most fatal cases are those of the third class, in which there is a distinct hereditary tendency to the disease. Unfortunately we do not, as often as we wish, have the opportunity of treating these cases in the very earliest stages; and it is in these stages, when the physical signs are hardly evident enough to satisfy us that there is disease present, that our treatment is of the greatest use. My attention has frequently been directed to the chest by such symptoms as gradually increasing debility without evident cause, increased frequency of pulse continued for weeks, failing appetite with symptoms of dyspepsia; and often I have found audible signs of disease where the patient has not complained of any cough whatever. In other cases, when I have not been able to satisfy my ears, but felt sure, from the symptoms complained of, that mischief was brewing, the signs have at last often become evident. Whenever we meet with some of the early

symptoms of phthisis in patients who have hereditary tendency to the disease, I think by far the safest plan is to treat the patient as if the lung-disease could be distinctly heard.

Now in this, the hereditary disease, I do not think that we have any specific remedy on which we can depend; but, at the same time, we have a mode of treating these cases which often, when I have hardly hoped for success, has proved very successful and satisfactory. I am afraid we are all apt to follow fashion, to prescribe remedies and modes of treatment at the time in vogue, and to forget the treatment which sound common sense, combined with a reasonable amount of medical knowledge, would dictate to us. The patient should live in a part where the air is pure, neither too dry nor too moist, and where the climate permits out-door exercise to be taken. Hence, removal to some of the places celebrated for this climate is often of marked benefit, simply because the patient can then take plenty of exercise.—If the patient can take cod-liver oil he certainly should; and I have certainly seen the remedy act wonderfully, as if it had a specific effect. It has relieved the cough, fattened and strengthened the patient. On the other hand, many patients cannot take it in any way, or at any time, without suffering in some way or other. They feel sickly, suffer from dyspepsia after it, are relaxed, or have their appetites spoilt by it.—I have tried the inhalation treatment extensively. Some patients say that they have derived benefit from the treatment, and cough has been relieved, the quantity of expectoration has diminished, and the general symptoms have improved. Others seem to derive no benefit whatever; the inhalation in these cases increases the cough, impairs the appetite, and makes the patient ill.—In this, as in the other two varieties, I attach the greatest importance to the amount of out-door exercise taken, or in-door if the former be impossible; to proper ventilation, to the climate, the sponging of the body, and the taking of suitable food; and, as internal remedies, have found quinine, iron, and some of the vegetable tonics the most useful.—*Brit. Med. Jour.*, *Feb.* 23, 1884, *p.* 352.

DISEASES OF THE ORGANS OF DIGESTION.

24.—TREATMENT OF SEVERE FORMS OF CONSTIPATION.

By JAMES SAWYER. M.D., F.R.C.P., Senior Physician to the Queen's Hospital, Birmingham.

Constipation concerns the large intestine only; intestinal obstruction, the whole of the intestines, small as well as large. Constipation is slow fæcal progress in the large intestine, where alone true fæces are to be found. Intestinal obstruction is a

grave disturbance of intestinal permeability, in any part of the intestinal canal; it is practical impermeability of the intestines to the passage of their contents, either in the large or in the small intestine, in any part of the bowel, from pylorus to anus. "Constipation is essentially slow progress of the fæculent mass from the cæcum to the anus." It is this, and nothing more than this, so far as the mere position of the difficulty concerns us; albeit the pathological causes of constipation, when organic, and when such as narrow the lumen of the bowel, are apt, in their extremer developments, to determine intestinal occlusion.

The manifold errors of habits, of effort, and of diet, which tend to constipation, are well recognised by our profession. In the discovery of some of these, and in their timely and persistent rectification, we can cure, without drugs, many of the slighter forms of fæcal retention.

Each of us has his favourite carthartics; if we have tried their adoption well, we should not lightly change them. For cases of habitual constipation which do not yield without drugs, my favourite remedy is socotrine aloes. I have little faith in belladonna, and none in nux vomica. Aloes is especially useful in the fæcal sluggishness of sedentary persons. Properly given, the drug may be taken daily for years, without either losing its aperient efficiency, or producing any but the best results. I give one, two, or three grains of socotrine aloes in a pill, combined with a quarter of a grain of sulphate of iron, and one grain of extract of hyoscyamus, at bedtime every night. I find out, in each case, the exact quantity of aloes required to produce one full alvine evacuation after the morning meal. In this combination, the quantity of aloes will need readjustment from time to time, usually in the direction of reduction. I shall mention only one other drug for the class of cases I am now considering, namely, the American cascara sagrada. From my former experience of so-called new drugs, I have learned to employ such preparations with much caution, and to recommend them with more. But I now venture to state that I have used cascara sagrada in two or three cases of severe habitual constipation with marked success. I have given from fifteen to thirty minims of the American liquor, thrice daily, adapting the dose by the result, and endeavouring to secure one, or at most two dejections, in each twenty-four hours.

The ordinary symptoms of extreme fæcal retention are well known. Our experience, in the main, justifies us in expecting that such symptoms shall be acute, or at least subacute, in their urgency and duration, and that they shall be associated with complete temporary absence of alvine dejections, or at least with very obvious insufficiency of such evacuations, both in quantity and frequency. But we shall fall into error sometimes,

if we expect considerable fæcal retention always to be marked in this way. Of exceptional forms of extreme fæcal retention, I have met with two distinct varieties. In both, the process of accumulation has been slow; but in one, the graver signs of intestinal obstruction have at last become urgently and rapidly developed, as it were, as a climax; while, in the other, and rarer form of slowly developed fæcal retention, the condition has been chronic throughout, and the disorder has not perhaps been recognised until after a belly, only distended by a dilated colon filled with fæces, has been regarded as the seat of a huge tumour, the nature of which has been variously interpreted. I have known the extremest fæcal retention, filling the belly, encroaching on the thorax, and displacing the liver, lungs, and heart, presenting itself as a chronic condition, lasting for many years. Let me quote, very briefly, an extreme and very instructive instance of this kind from my note-book.

In the year 1871, a medical friend sent a case to me at the Queen's Hospital as one of obscure abdominal tumour, which had long resisted treatment at two neighbouring charities, and about the nature of which he was in doubt, and desired my opinion. I found the patient a pale ill-developed girl, aged 14. Her mother stated that, when the child was only two years of age, it was noticed that there was some enlargement of her belly. The child's bowels had habitually been confined, a week or more often elapsing without the passage of a motion. The evacuations had generally consisted of small portions of hardened fæces; but, from time to time, frequent and scanty liquid stools were passed. The quantity of urine appeared to have been normal; the appetite poor and capricious. The abdominal enlargement had gradually increased up to the time of the patient's application to me. I at once admitted the girl as an in-patient. I found she complained of occasional griping pains in the belly. She had never had any vomiting. Her motions were small in quantity and very watery. The tongue was clean. There was no pyrexia. The body was fairly nourished. The abdomen was generally enlarged, and the lower part of the thorax expanded. The superficial veins of the abdomen were slightly enlarged. A solid tumour could be felt to occupy the whole of the right side of the abdomen; it had no distinct margin above, and reached laterally about two inches to the left of the middle line; below, the edge of the hand could be readily passed between the tumour and the pelvis. The tumour was uniformly dull on percussion; palpation gave the impression of a doughy consistence, and firm and sustained pressure with the tip of the finger upon the mass produced a depression which lasted for some minutes after the finger was withdrawn. The heart was displaced upwards considerably; its apex was

found to strike the chest-wall at a point one inch and half above, and one inch to the inner side of, the left nipple. The circumference of the abdomen at the umbilicus was thirty-one inches. The rectum was found to be largely distended, and filled with hardened fæces. The patient was ordered a pill, consisting of a grain and a half of soco-trine aloes and half a grain of extract of hyoscyamus and a third of a grain of extract of nux vomica, to be taken with a drachm of sulphate of magnesia in one ounce of infusion of roses, thrice daily. An enema of cold water and table-salt was given night and morning. Before the administration of the first enema, I freely broke up the contents of the rectum with my forefinger and the handle of a large table-spoon, and I removed a very large quantity of hardened fæces, together with three plum stones. On the following day, two chamber-pots were literally filled to the brim with pultaceous fæces, and the abdomen was found markedly diminished in size. On the next day, two chamber-potfuls of fæces followed the morning injection. On the following day, three copious motions were passed. On the next day, there were two free actions of the bowels, and it was noticed that the abdomen was smaller and softer, and that the heart's impulse had fallen to the level of the left nipple. In three days more, the enemata were finally discontinued. Careful physical exploration failed to find any abnormal signs in the abdomen. Faradisation was ordered to be gently applied to the abdominal muscles daily. From this time the patient did well, without interruption, and was discharged fourteen days after her admission. She attended a short time as an out-patient, taking steel and aloetic purgatives, and remained well, without any fæcal reaccumulation.

In this case, you will notice that extreme fæcal retention, sufficient to displace the heart into the infraclavicular region, to distend the superficial veins, and to form a very large abdominal tumour, was unattended by vomiting, scanty urine, abdominal tenderness, or other local disturbance than "occasional griping pain in the belly." You will notice, too, the record of an important point in diagnosis. A large portion of the patient's abdominal cavity was obviously occupied by some solid mass. I had to decide upon the nature of the abnormality. I found that firm and sustained pressure with the fingers over the tumour produced a depression in its mass which lasted for some minutes after the pressure was withdrawn. This very exceptional physical sign is almost absolutely diagnostic of considerable fæcal accumulation. The successful progress of the case illustrates, also, the value of using together a variety of therapeutic measures. In the treatment of fæcal

retention, the best results are only obtainable by the adoption of a well-considered combination of remedial resources. I did not rely on only one method of emptying the distended intestine. I broke up and dug out all the excrement I could reach through the anus, and I kept up the concurrent and continued use of aloetic purgatives, enemata, and faradisation.

I am afraid our profession does not adequately appreciate the immense advantages to be derived in the treatment of many of the severer forms of constipation and intestinal obstruction from the efficient use of the enema. In France I understand the enema is the routine domestic aperient. We do these things better in England. The custom of relieving slight constipation by an immediate resort to enema has never become popular on this side of the Channel, and it is well it is so. My experience has led me to discountenance decidedly the systematic use of rectal injections in the ordinary domestic treatment of the slighter forms of fæcal sluggishness. Such cases may be treated better, and especially with less tendency to chronicity, by other means. On the other hand, however, in the severer forms of fæcal retention, we ought always to use aperient enemata, and we must take care we use them efficiently. In persons past the meridian of life, and especially in persons of sedentary habits, what may be called simple fæcal retention is a very frequent form of constipation. In such persons, this form of constipation is relatively very frequent, both as compared with other varieties of constipation, and also as compared with the same form of constipation at other times of life, and in individuals of other habits. In such persons, coprostasis (a good old name for fæcal stagnation) is especially apt to produce complete intestinal obstruction. It is in these cases, especially, that life may be saved by enemata. I do not know any form of intestinal obstruction in which enemata can do harm. In most cases, they take a chief place amongst our most potent means of doing good. In many cases which are at first uncompromising, and even when the predisposing cause of the obstruction is some organic and incurable disease, we may repeatedly relieve a threatening fæcal accumulation, and long keep off a fatal fæcal stagnation, by the due use of enemata. It is, perhaps, not too much to say that enemata far surpass any other remedies in curative value in the simple coprostasis of advanced life. Within the limits of this paper, I cannot particularise all the practical details of apparatus, of quantity, quality, and frequency of intestinal injection, and the various manipulative niceties of administration concerned in the question of the therapeutic use of aperient enemata. But I would take this opportunity of affirming that, in all severe cases of constipation, and in all cases of intestinal obstruction in which we use

enemata, we can only administer our injections efficiently by means of the long tube of O'Beirne. Let me recommend O'Beirne's classical treatise on defæcation to those who are unacquainted with it. I do not think I have ever reaped more practical profit from any of my medical reading than from a study of its pages. The gist of O'Beirne's book is the recommendation of the long enema-tube which, for fifty years, has been known by his name. Never entrust the use of O'Beirne's tube to a nurse. The efficient passage of the instrument into and through the sigmoid flexure of the colon is a delicate and difficult operation, which the medical attendant ought always himself to perform for his patient. Much unnecessary detail has been taught about the composition of enemata. When we use an enema for the purpose of clearing the bowel of fæces and flatus, the quantity of the injection is its chief quality. I am accustomed to tell my pupils that, when they give an enema, they should always ask themselves whether it is to be retained or returned. If it be designed that the injection shall be retained, as in the case of a nutrient and sedative enema, its quantity can scarcely be too small; if, on the other hand, it be intended to move the bowels to the expulsion of their contents, the quantity of an enema can scarcely be too large. The quantity of an aperient injection is precisely so much of it as can be passed into the bowel. For such an enema to be as large as possible, is only to be large enough.—*British Medical Journal, Nov.* 17, 1883, *p.* 905.

DISEASES OF THE URINARY ORGANS.

25.—ON CATHETER FEVER.

By Sir Andrew Clark, Bart., M.D., F.R.C.P., Physician and Lecturer on Clinical Medicine, London Hospital.

Catheterism is occasionally followed by a fever, which has received the various names of urethral fever, urethro-vesical fever, urinary fever, uræmic fever, catheter fever, and so forth; in some cases this fever is dependent upon, or associated with, purulent arthritis, ordinary pyæmia—what is known in England as surgical kidney or interstitial nephritis—and, in a small, but still noticeable, percentage of cases no adequate structural cause of death has been found. It was of this last variety of fever that I spoke upon a recent occasion at the Clinical Society, and it is of this variety alone that I make the following propositions:—

First, that about middle life in men perfectly healthy, or with no discoverable evidence of disease, except perhaps, and

even that not always, a low density of urine, the commencement of the habitual use of the catheter is sometimes followed by fever of the remittent type, which often ends in death, and that for the fatal issue in such cases no adequate structural explanation can be found. Secondly, that it is important that such a fever, arising in the midst of apparent health from such a seemingly small cause, and leading so often (as it certainly does) to a fatal issue, should be well and widely known, lest death should take the friends of the patient by surprise, and arrangements necessary to the welfare of a family should be left unmade. Thirdly, that although it is well known that in persons affected with renal disease, or with chronic gout, or with grave disorders of the general health, the commencement of habitual catheterism is attended with peril to life from secondary fever, the fact that this fever may arise in what seems to be good health, and without the mediation of any visible structural lesion, issue in death, is not well known—or at least well known only to a few—and has, I repeat, no adequate place in English surgical literature or in the English surgical teaching of this time. Of course this knowledge will be found in special monographs and papers, but those are the luxuries of the few, and for the most part the luxuries of specialists who work in that direction; but such knowledge should be, as I think, fully imported into all our common text-books, and so made accessible to the whole body of the profession. Fourthly, that this fever is neither distinctly uræmic nor distinctly pyæmic; that although, having some of the characters of each, it has all the necessary characters of neither; that probably it begins in the nervous system; that probably the disturbance of the nervous system reacts in the first instance upon the general metabolism of the body, and in the second instance upon the secretory organs, beginning with the kidney; that the effect upon the kidney may consist either in structural alterations of the kidney, invisible by the aid of our finest instruments of research, or (as seems to me much more probable) in alteration of the constitution of the blood, that dynamic condition of its constituents in the renal vessels essential to the elaborative action of the secretory cells thereof; and lastly, that the concurrence of these conditions may, and often is, enforced by septic reabsorption into the blood. Fifthly, that a more complete knowledge of this variety of fever, and of the conditions of its origin, maintenance, and increase may, at least we may hope, lead to a material diminution of its mortality; and that even now, by treating in a serious manner entrance upon catheter life by taking the precautions set forth by Sir Henry Thompson, by great temperance in the use of foods and stimulants, by rest, warmth, and by other general

means, upon which I shall not now dwell, such mortality, I repeat, may be possibly considerably diminished.

Of these propositions the one at the present moment most open to attack is the fourth, wherein it is asserted that this fever is not distinctive and exclusively uræmic. For in these days it has come to pass that almost every writer of distinction adheres to the view of the uræmic origin and nature of catheter fever, or of the thing known under that and other names, and I am, as it were, left by myself very imperfectly armed to oppose it. I oppose it. I ground my opposition to the exclusively uræmic theory upon the fact that the phenomena of catheter fever, not as they exist at a particular moment, but in their assemblage and in their progress together, are different from those of the ordinarily recognised uræmia. The duration is at once longer and shorter—longer than that of acute uræmia, and wanting its headache, its perversions of sensation, its changes in the urine, its convulsions, its profound coma; shorter than that of chronic uræmia, wanting its neuralgias, its recurring headaches, its defects of sight, its fleeting paralyses, its itchings of the skin, its vomiting, its characteristic breath, its attacks of dyspnœa and palpitations, its painful nervousness, its low temperature. Furthermore, the urine of the catheter fever of this variety, at least of catheter fever, is always loaded with micro-organisms of various kinds, and although it is deficient in urea and contains more or less albumen, it deposits no tube casts and it is capable of amendment. Lastly, whilst chronic uræmia issues in death, catheter fever may issue, sometimes does not issue, in complete recovery. Sir Henry Thompson may remember that I saw with him a distinguished nobleman not far from Oxford-street, who had to make an entrance upon catheter life, and he very justly and wisely warned the relatives that it was a serious procedure, and that perhaps he might suffer constitutional disturbance after the starting of this mode of life; and it happened that he did suffer this constitutional disturbance. It happened indeed that he had a mild variety of this fever which I am now describing, and that it continued for between a fortnight and three weeks. Eventually, with Sir Henry Thompson's help, he recovered, and I think I may say now, five, six, or seven years afterwards, he is in good health at an advanced age. Except in its long duration, in its occasional rigors of great severity and its exceptional clearness of mind, the phenomena of what is called endocardial fever resemble more nearly those of the fever which I have called for the moment catheter fever, than any other malady with which I am acquainted.

Two questions of a practical kind arise out of this study of the history of catheter fever. The first is this: seeing that by

almost universal assent the fever originates at least in a disturbance of the nervous system, and seeing furthermore that in the cases accessible to me at least there is no account of the fever following in cases where narcotics or anæsthetics have been used, may it not be that the fever is capable of being cut short by the administration on entering upon habitual catheterism of narcotic or anæsthetic remedies? I remember that my great master, Syme, in Edinburgh, for a reason which his instincts very often knew better than his understanding, invariably gave his patients whom he had to catheterise frequently a grain or two of opium from the very beginning, and I must also add that he was singularly free from catheter accidents. The second question is this: assuming the presence of the fever, and seeing that quinine has signally failed in controlling it, what are the drugs to be employed on such occasions? and what is the sort of hygienic management to be followed, especially in respect of food and alcohol, which are so variously used on such occasions, in order that the fever may be brought, if that be possible, to a successful ending?—*Lancet*, *Dec.* 22, 1883, *p.* 1077.

26.—FEVERS WHICH SOMETIMES FOLLOW CATHETERISM IN PROSTATIC ENLARGEMENT.

By HENRY MORRIS, M.B., F.R.C.S., Middlesex Hospital.

Whilst recognising the fact that suppurative pyelitis sometimes results from the extension of inflammation commencing in the bladder, I am familiar with two forms of fever which follow catheterism in old men with enlarged prostates and which are quite unconnected with this origin. First, there is that form of urethral fever which sets in within an hour or two of the passage of the instrument with rigor and sudden elevation of temperature, sometimes reaching 106·6° F., and which lasts from twenty-four to fifty-six or seventy-two hours, and then, happily so far as my experience goes, subsides with the recovery of the patient. This is the form which occurs occasionally in persons of any age, and when an instrument is passed for other reasons than prostatic enlargement, and also in other conditions than those in which any instrument at all is used. Thus one of the most severe cases of this form of fever which I have witnessed occurred in a man with cancer of the glans and body of the penis; the attack sets in during the act of micturition upon the sudden completion of an urethral fistula, formed by the ulceration of the cancer, through which some of the urine trickled. Second, a continued or intermittent fever which does not follow the commencement of catheterism immediately, but comes on after several or perhaps many days,

and which terminates in death. In these cases chronic renal disease has long preceded the catheterism, and has been evinced by the excretion of an abnormally large quantity of pale limpid urine of low specific gravity and more or less deficient in the quantity of urea which ought to be eliminated in twenty-four hours. It is to the state of the kidney prior to surgical treatment, and not to the state of the bladder after the commencement of catheterism, that we ought to look for an explanation of this form of fever, and in this manner. The granular kidney, or the kidney which has been changed by chronic interstitial nephritis, though perhaps not of the true granular type, becomes the seat of acute suppurative inflammation, perhaps throughout, but more likely in areas only, if the distension from obstruction has reached a certain point. It seems as if the two conditions are requisite: (*a*) a pre-existing degeneration of the secreting structure; and (*b*) an alteration, from obstruction, in the intra-renal pressure, whereby the ureters, pelves, and calyces of the kidneys become dilated. When these two conditions exist, a state of active congestion of the kidney is brought about by the release of the distension by means of the catheter. This congestion is not only active in the ordinary sense, but it is much more, for it stimulates a degenerated structure into extra functional activity by bringing, within any given time, to the secreting apparatus an extra amount of material for it to work upon. This increased flow of blood to the kidney cannot be even in part controlled or checked by the natural elasticity of the solid organs and their capsules, because the pre-existing chronic changes have led to the adhesion of the over-stretched capsule, not only to the degenerate renal substance, but also to the surrounding peri-renal fatty tissue; and, further, the elasticity of the renal substance has been destroyed by the intra-renal pressure of long pent-up urine. In this way does acute pyelo-nephritis set in upon the top of chronic interstitial fibrosis.

I have noticed that cases of prostatic enlargement, in which retention of urine leads to the use of the catheter soon after the commencement of the milder troubles of micturition, and in which, consequently, dilatation of ureters, &c. (and therefore of undue intra-renal pressure) has not advanced far, are not prone to be affected by this continued or intermittent fever, even though chronic renal disease, as evinced by the density, colour, and quantity of the urine, exists; but that the cases in which the troubles of micturition come slowly and insidiously, and have extended over a period of one, two, four, or five years before the surgeon's aid is sought, and in which, therefore, dilatation has occurred, in addition to renal fibrosis—that these are the cases in which fatal fever should be looked

for especially. My belief is, therefore, that the morbid changes commence in the kidney, and, when they extend, spread from the kidney to the bladder, and not in the reverse direction from bladder to kidney; and that this is so is proved in some cases most clearly by the chronological order of symptoms, and by the post-mortem appearances of the urinary organs.

The treatment indicated by this view of the danger of fever is: (1) The recumbent position for some days after the commencement of the catheterism, so that posture may favour the gradual change in the intra-renal pressure; with this view, too, the catheter ought to be first introduced only when the patient is lying down, and in his own bed, where he should remain. (2) Bland nutritious substances, in small quantities only, ought to be given as food for some days, and fluids of all sorts should be restricted on account of their tendency to increase the activity of the kidneys. (3) Ergot of rye given in moderately large doses should be tried if the quantity of urine secreted is abnormally large. I have seen great benefit produced both on the state of congestion of the prostate, and on the excessive activity of the kidney, by the administration of a few doses of this drug, whose action on the coats of the arteries is well known.—*Lancet*, *Dec.* 22, 1883, *p.* 1080.

27.—ON THE TREATMENT OF PROSTATIC GOUT.

By REGINALD HARRISON, F.R.C.S., Surgeon to the Liverpool Royal Infirmary.

I propose offering some observations on an inflammatory condition of the prostate which, though never, I believe, terminating in abscess, is attended with much suffering, and not unfrequently leads to further consequences. Though this gland is not so often selected for acute gouty manifestations as the ball of the great toe and the vicinity of some of the smaller joints, yet cases are sufficiently common to make the subject deserving of comment, and particularly in reference to one or two points. Gouty prostatitis, so far as I have observed it, occurs in persons who, though having a gouty diathesis, either hereditary or acquired, have previously remained free from the more ordinary attacks of this disorder. Its occurrence is often assigned to catching cold, getting wet, or sitting upon damp seats. Like gout acutely affecting the great toe, the attack usually comes on at night, the patient experiencing severe pain, which he refers to the perineum, and not unfrequently likens to a hot cork. Though painful, the desire to micturate is irresistible, and is accompanied with spasms, which often render any attempt to retain urine, even while the patient is getting out of bed, almost impossible. Sympathetic pain is at the

same time experienced in the groin, or in one or both testicles, rendering the latter extremely sensitive to the touch. Exploration of the rectum with the finger—a necessary examination, which is sometimes so painful as to call for an anæsthetic—shows the prostate to be both tense and tender. During the day the symptoms generally abate, to recur at night. Like the analogous manifestation in the great toe, these acute prostatic attacks are not usually of long duration, as they merge into a chronic form, which will presently be noticed. The urine is loaded with lithates, and is invariably of an acid and irritating character. After an acute attack the prostate is often left excessively sensitive, and this is a point worthy of special consideration. After an acute attack of gout in the foot the limb is tender, and the person is more or less lame. So with the prostate: it remains sensitive and the patient dreads to call forth sufficient muscular force to completely empty his bladder. In fact, he lets the urine dribble off voluntarily, and retains a portion of it, so as to form a sort of water-bed behind his prostate. In this way he wards off from his sensitive gland the last and most painful efforts of each act of micturition. Watch a patient, with a prostate tender from gout, pass water, and the manner in which he cautiously eases off the pressure as the act is about to close is very significant. I have satisfied myself on several occasions that a degree of retention was thus caused by passing a rubber catheter and removing an ounce or so of urine, when it was believed by the patient that he had emptied his bladder.

It is generally conceded that an hypertrophied prostate which causes urine to be constantly retained within the bladder is a condition favouring the formation of stone. I have thus endeavoured to show that the urine of the gouty is not unfrequently submitted to similar conditions, but under different circumstances. May not this consideration explain why the inorganic elements of the urine of one gouty person concrete, whilst in another they do not? Is the shortness and dilatability of the female urethra sufficient to explain the rarity of stone in women, even in those of a markedly gouty diathesis?

In the treatment of acute prostatic gout there are one or two points to which prominence is to be given. In the first place it is always associated with a highly acid condition of the urine, and with an excess of urates as well as of uric acid. The administration of alkalies under these circumstances can hardly be regarded other than as a natural expedient. It has been stated that the neutralisation of these urine-salts by the alkali is little else than masking the disorder, as the cause of it still remains untouched. But there is a mechanical aspect to this question which must not be passed by entirely without

notice. One effect of the administration of alkalies upon such urine is not only attended with a marked disappearance of the urate salts from the urine, but careful microscopical observation has shown that the use of alkalies is frequently followed by a change in crystalline form, which is of considerable advantage to the patient, though he may still continue to void urates. When the degree of vesical and urethral irritation was intense, I have seen all this disappear coincident with a change in the crystalline form, being brought about by some artificial means. It is interesting to notice the relation the mucus that is deposited in the urine holds to the kind and quantity of the crystalline forms existing in health as well as in disease in this excretion. Some crystals of uric-acid salts, for example, excite an immense discharge of this mucus. Such salts seem to act upon the urinary apparatus much in the same way as a foreign body in the eye stimulates a flow of the natural secretion, and renders it inordinate so long as the irritant remains there. Can it be doubted that the means we possess of influencing the urinary mucus through changes in the urine salts we are capable of artificially effecting are not important ones in relation to the subject of stone formation? Does not such a consideration take us one step further back in treating calculous disorders, or the tendency thereto, by bringing them distinctly within the scope of medicines rather than of machines?

The chronic form of the disorder, where the prostate remains tender for a considerable period, or until it is relieved by treatment, requires careful consideration, as it is a far more frequent cause of residual urine than is generally supposed. Occurring, as it often does, at a period of life when hypertrophy of the gland usually takes place, the demonstration by the catheter that the bladder does not empty itself is a circumstance which is sometimes received and acted upon as conclusive evidence that the time has arrived when what Sir Andrew Clark has aptly spoken of as "the catheter life" should commence. There is this important difference, however, between the residual urine of a sacculated bladder in connexion with a large prostate and that dependent on a gland which is sensitive and merely temporarily enlarged: the former is benefited by catheterism, the latter is aggravated by it. The former is comparatively uninfluenced by medicines, whilst the gouty prostate which interferes with the complete emptying of the bladder is speedily relieved by those measures which belong to the department of the physician rather than of the surgeon. Where the urine is rendered alkaline in the bladder by circumstances which bring about its decomposition, it is not difficult to understand how a phosphatic stone may be the result. In the view I have urged, relating to another reason for residual urine, is

to be found a vesical cause for the collection and aggregation of those materials which the urine of the gouty furnish. It has been observed by Dr. Ord, "Two-thirds of all urinary calculi are in bulk composed of or start from concretions of uric acid."

The symptoms of chronic gouty prostatitis are often anomalous and difficult to sum up; they may be briefly enumerated as urine habitually loaded with uric acid and urates, unnatural sensitiveness of the prostate to the touch, or even to pressure applied to the perineal region, and the presence of uncomfortable sensations referred to the neck of the bladder, as if there was a swelling, or the viscus was not emptied, the latter sensation being practically well founded. The treatment of the affection resolves itself into the employment of those general measures appropriate to the gouty diathesis, which it is not necessary for me to refer to. Iodide of potassium internally, and a mild form of counter-irritation to the perineum, will often be found very advantageous in removing prostatic tenderness. Lastly, this is a class of disorders which is often largely benefited by some spas where the diathesis is corrected by suitable diet and waters. In our own country I have found Buxton of very great service; whilst abroad there are many watering-places which such persons may visit with advantage. It is not always easy to recommend suitable drinks for these cases. I have found the Giesshübler Sauerbrunnen a very pleasant beverage; as imported into this country I can endorse Dr. Kraus' recommendation of it as "a very pleasant and refreshing drink, which invigorates the nervous system, removes acidity of the stomach, gently stimulates the action of the bowels, and causes a copious flow of urine, thus combining the qualities of a good drinking water with those of a mild curative agent." It mixes well with red wine.—*Lancet, Nov.* 24, 1883, *p.* 896.

28.—ON SOME PRECIPITANTS OF ALBUMEN IN THE URINE.

By VINCENT HARRIS, M.D., St. Bartholomew's Hospital.

CLASS A.—1. Heat alone. 2. Heat and nitric acid. 3. Nitric acid alone used in the cold.—The foregoing tests are what may be called established. The following (Class B) are on trial, each being believed by its introducer to be specially delicate as an albumen precipitant.

CLASS B.—1. Picric acid and acetic or citric acid. 2. Acidulated brine. 3. Sodium tungstate and acetic or citric acid. 4. Potassio-mercuric iodide, or Nessler's reagent. 5. Potassio-mercuric iodo-cyanide. 6. Potassium ferro-cyanide and acetic or citric acid.

1. *Picric acid*, as a test for albumen in the urine, has been brought forward prominently into notice during the last year by Dr. George Johnson, and his son Mr. E. S. Johnson. Dr. Johnson stated in a communication to the Clinical Society in March last, that he had used picric acid as an albumen precipitant for two years with great satisfaction. He described three several ways of using the test:—

(*a*) Into a test-tube six inches long the urine is poured to within two inches of the top, then the tube being held in a slanting position, about an inch of the picric acid solution is gently poured on the surface of the urine, when, in consequence of its low specific gravity (1003), it only partly mixes with the upper layer of the urine, and, as far as the yellow colour of the picric acid extends, there will be more or less turbidity from coagulated albumen, contrasting with the pellucid unstained urine below. This method is an imitation of Heller's method of testing with nitric acid.

(*b*) With the solid picric acid either in powder or in crystals. "As much as is equal in bulk to a peppercorn may be shaken up in a test-tube with a column of urine about an inch in height. As the powder dissolves the urine becomes turbid with coagulated albumen. The object is to add as much of the test as the urine will dissolve." The application of heat quickens coagulation.

(*c*) To add fifteen or twenty minims of water to the peppercorn bulk of acid in the tube, quicken the solution by the application of heat; an equal bulk of urine is then gradually added to the hot solution, when albumen, if present, is at once detected.

In using the picric test the urine must be acid, or previously rendered so by the addition of acetic acid.

In bringing forward picric acid as a test for albumen, Dr. Johnson claims that it is more delicate and therefore more trustworthy than nitric acid, whether the latter be employed by the method of dropping the acid into the cold urine, or by pouring the urine on the acid previously placed in the tube; and he says that, comparing the two, he diluted a specimen of albuminous urine until one or other of the tests failed, and the result was that "picric acid solution shows the presence of albumen in a specimen *diluted considerably beyond the point at which the nitric acid fails to give any indication;*" and further, "that picric acid often causes an immediate albuminous opalescence in specimens in which nitric acid only slowly, and after an interval of some minutes, gives a similar but sometimes doubtful reaction."

Before mentioning my experience of this test I will briefly allude to one of the objections brought against it, viz., that it

precipitates peptones as well as native serum-albumin. This was pointed out by Dr. Ralfe and others. It appears to be well known, as previously stated, that peptones do occur in urine, but as regards their clinical significance few observations have been made; and it seems to me, therefore, that as several very simple methods exist for distinguishing between peptones and serum-albumin, it is a positive advantage to have the presence of peptones pointed out when they are present in urines, either with or without serum-albumin. It would be apart from the purpose to consider the question whether peptones in the urine signify any kidney-disease or digestive derangement only, but it is interesting to note the fact, demonstrated by Parkes and others, that it is possible to produce or increase previously existing albuminuria by the ingestion of large quantities of proteid food; and if albumen (serum-albumin), then in all probability peptones also.

My experience with picric acid as an albumen precipitant may be summed up in a few lines. I have tried the test in saturated solutions with very weak solutions of egg-albumin, and also with albuminous urine diluted to a definite extent, fifty or a hundred times, and have never found it fail where another test was successful. I have used the solution with acetic acid and with citric acid, and find that with either of these the action of the reagent appears to be more certain. The disadvantages of the test appear to be the colour of the reagent, making it difficult to see a faint cloud of precipitate, and the fact that when used in solution not to produce a ring but in the ordinary method (Dr. Johnson's third method), it is necessary to add a certain considerable amount before precipitation takes place. One or two peculiarities in the action of the test may be added, and in the first place, the albumen appears to be precipitated in finer granules than with other tests; secondly, that it subsides quicker. These may be mere accidents happening in my own experiments; but at any rate, in several cases it was so marked that I specially noticed it; and if the latter be always the case, it certainly would increase the value of picric acid in the general clinical quantitative estimation of albumen. With anything but saturated solutions of picric acid the results are not, I think, nearly so satisfactory.

It should be distinctly understood that picric acid precipitates not only native but derived albumins, peptones, and mucin (Ralfe), and confirmatory tests should therefore be employed in all doubtful cases if it be required to test the variety of proteid or allied substances present in the urine.

2. *Acidulated brine.*—A test introduced by Dr. W. Roberts, and described in the Lancet about the autumn of last year. If a saturated solution of sodium chloride be added to urine con-

taining albumen, to which has been previously added some acid solution, a precipitate of albumen will result; or the test may be made by adding the acid to the solution of the salt and filtering. As regards the acid used, Dr. Roberts prefers dilute hydrochloric, but other mineral acids will answer the purpose, or even acetic acid. This test corresponds closely with the method of precipitating proteids by means of acetic acid and sodium sulphate solution. The test may be used by dropping into the urine or by the contact method.

3. *Sodium tungstate.*—Dr. Oliver has done good service in bringing to light this test for albumen. In his hands it has proved to be a most valuable reagent. He recommends that it should be used as a test solution, prepared according to the following formula:—Saturated solutions of sodium tungstate (1 in 4) and citric acid (10 in 6), equal parts. It may be used either dropped into the urine or after the manner of Heller's test; and in the author's hands "always quickly revealed the same minimal proportions of albumen as could only be brought to light by picric acid and by the other tests of equal keenness." I look upon this test as even more satisfactory for minimal amounts of albumen than for maximal. The advantage of sodium tungstate is that it forms a perfectly colourless solution; is not apt to decompose, and is very cheap. I have tried this reagent in the "compound papers" form of Dr. Oliver, and in solutions with citric acid and with acetic acid, and have been highly satisfied with the result. In nearly every case the solution was equal in delicacy to any other reagent. I have experimented with weaker solutions, both 5 per cent. and 1 per cent., and am inclined to believe that the former is the best strength, as in excess of the reagent the albumen precipitant is redissolved.

6. *Potassium ferro-cyanide and acetic or citric acid.*—This reagent, which has long been known as one of the best tests for albumen, and therefore should properly be placed in Class A., has been placed last in the list, because it has appeared from my experiments, all things considered, very nearly the best albumen precipitant, and I am strongly inclined to urge its more general use. Several methods of using the reagent I have tried: (1) Strongly acidulating the urine with acetic acid (5 per cent. to 10 per cent.), or of saturated solution of citric acid, filtering if a precipitate fall, and then adding one or two drops of a saturated solution of the ferro-cyanide; (2) Mixing one-third of a solution of ferro-cyanide with two-thirds (5 per cent). solution of acetic acid; (3.) Mixing equal parts of a 1 per cent. solution of ferro-cyanide and of acetic acid 5 per cent. All of these methods precipitated the albumen if in fair amount; but as a delicate test, the first method far exceeded the others. Dr. Oliver found that this test failed to detect the presence of albumen in solu-

tion in twelve out of twenty cases. This I cannot help fancying must have been somewhat strange, but may have been due partially as he himself suggests, to his method of using it. I found the ferro-cyanide test only surpassed in delicacy by picric acid, and then in only a few instances. It was about equal to sodium tungstate and citric acid, and surpassed sodium tungstate and acetic acid.

In Dr. Oliver's experiments with twenty urines containing minimal quantities of albumen, strong nitric acid failed in sixteen instances; boiling in fourteen; acidulated brine in fourteen; and potassium ferro-cyanide in twelve; whilst picric acid and potassio-mercuric iodide gave distinct and generally a sharply defined ring in every case.

Comparison of the reagents.—I may give an example of the way in which I compared the reagents. Having taken a sample of albuminous urine, I boiled it, and estimated by the rough clinical method the amount of albumen present. I then made solutions of different strength, and applied the reagents one by one to different examples, comparing, as a rule, only those which, by previous trial, I had found to be the most sensitive. Generally two or three gave out, as it were, together, leaving one or more of greater delicacy. Sometimes I only compared one of Class A. with two or three of Class B.; but when I had any doubt I compared more. I early considered three tests to be of about equal power, and therefore in some cases I did not compare more than one of those with the remaining tests. As regards the solutions of potassio-mercuric iodide, and potassio-mercuric iodo-cyanide, these tests were used separately in a different series of experiments, and were not compared directly with the others, as they appeared to precipitate other possible constituents of urine. I am about to be engaged in submitting the other tests to similar experiments, viz., picric acid, sodium tungstate, and potassium ferro-cyanide.

Results.—In the above manner I have examined, with careful dilutions, about twenty urines, besides solutions of egg albumin, and have come to the conclusion that the three tests, viz., picric acid, sodium tungstate, potassium ferro-cyanide, are about the most delicate albumen precipitants, and should be reckoned as being about on a par, with preference in favour of picric acid. My experience of acidulated brine makes me place it as somewhat less delicate than nitric acid used as Heller's test, but more convenient, as being less corrosive. In my hands the new test of Dr. Oliver, potassio-mercuric iodo-cyanide, has been, for some reason or other (no doubt my own fault), a failure, It is not likely to be very generally used, I think, in consequence of the difficulty in preparing it, so that other things besides albumen should not be precipitated by it. Of potassio-

mercuric iodide, I need farther experience before definitely stating my belief as to its use as a precipitant of albumen. It is certainly not superior to the three first-mentioned tests. I consider boiling with the addition of nitric acid a very unsatisfactory test for minute traces of albumen in solution.

Of acidulating the urine.—With all the tests, picric acid, sodium tungstate, potassium ferro-cyanide, and salt-solution, it is necessary to acidulate the urine either previously to adding the reagent or together with it, and various acids have been suggested.—*St. Bartholomew's Hospital Reports*, 1884, p. 73.

29.—ON THE PICRID ACID AND OTHER METHODS OF TESTING FOR SUGAR IN THE URINE.

By GEORGE JOHNSON, M.D., F.R.S., Prof. of Clinical Medicine; Senior Physician to King's College Hospital, &c.

[We take the following on the chief tests for sugar from Dr. Johnson's handy little book "On the Various Modes of Testing for Albumen and Sugar in the Urine," two lectures revised and re-published by him, in the hope of promoting the practice of testing for those products *in every case of disease*.]

Moore's Test.—I pour about a drachm of saccharine urine into a test-tube, and add half its bulk of liquor potassæ, and heat it over the lamp; and after boiling it for a minute or two, you see it gradually assume a brandy-brown colour. This test is easily applied, but it is not very delicate, since it will not indicate a proportion of sugar less than about two grains to the ounce. Then Moore's test has sometimes misled inexperienced observers in this way:—Liquor potassæ often contains lead from the bottles in which it has been kept, and when lead-contaminated liquor potassæ is boiled with albuminous urine, the sulphur of the albumen combines with the lead to form a dark sulphide, which unpractised observers might mistake for the brown colour produced in saccharine urine.

The Fermentation-Test.—When saccharine urine is mixed with yeast and kept warm, fermentation takes place with the evolution of carbonic acid and the formation of alcohol. Dr. Wm. Roberts has shown that this test may be made use of for a quantitative analysis. As the sugar is decomposed, the specific gravity of the urine falls. Each degree of specific gravity lost indicates one grain of sugar to the ounce. The great objection to this method is the length of time, at least twenty-four hours, required for its completion. The urine is capable of absorbing about its own bulk of carbonic acid, and, according to Dr. Roberts, urine containing two and a half grains to the ounce or less, gives no visible sign of fermentation. It is therefore less sensitive than even Moore's test.

Trommer's Test.—To this saccharine urine in a test-tube I add a drop or two of a solution of sulphate of copper, and to this an excess of liquor potassæ. The oxide of copper, which is first thrown down, is redissolved, and forms a clear blue liquid. Now, on applying heat the oxide of copper is reduced to a sub-oxide, which forms a dense red or yellow deposit. An excess of copper, not being dissolved, may cause confusion, and the dark brown colour, from the action of the potash on the sugar, may interfere with the result.

Fehling's Solution.—A more satisfactory mode of applying the copper-test is in the form of Fehling's solution, which contains the following ingredients:—Sulphate of copper, 90½ grains, neutral tartrate of potash, 364 grains, solution of caustic soda, specific gravity 1·12, four fluid ounces, cold water to make up six fluid ounces. To use this solution, a column of about three quarters of an inch is poured into a test-tube, and heated until it boils, and then a drop or two of the urine to be tested is added. In a few seconds, if the urine contain much sugar, the liquid becomes of an opaque yellow colour, and a copious red or yellow precipitate falls. If the quantity of sugar be small, the urine is added more freely, but not beyond the volume of the copper-solution. Fehling's solution soon undergoes change by keeping, a portion of the oxide of copper becomes precipitated, and then, of course, the strength of the test is changed. When the test has been kept for some time, it will deposit suboxide on boiling without the presence of sugar. This is one reason for boiling the test before adding the suspected urine. If boiling the liquid render the test turbid, it must be filtered, or a fresh solution prepared. When the solution is used for a quantitative analysis, it must be freshly prepared, and its strength is such that 100 minims are decomposed by half a grain of sugar, the decomposition being shown by the decoloration of the liquid, and the precipitation of the sub-oxide of copper. When the urine is highly saccharine, it must be diluted to a definite proportion, five, ten, or more times, before the analysis is made, and then the result is to be multiplied by the number of dilutions.

For laboratory-work, Dr. Pavy has modified and improved upon Fehling's method of analysis. The essential difference between the method of Dr. Pavy and that of Fehling consists in the addition of a sufficient quantity of ammonia to the copper-solution to prevent the precipitation of the cuprous oxide, after its production by the reducing action of the glucose. Rochelle salt (potassio tartrate of soda), though it effectually dissolves cupric oxide, is incapable of dissolving cuprous oxide, and some difficulty is often experienced by Fehling's process in ascertaining the exact moment of disappearance of the blue

colour due to cupric copper, on account of the turbidity and red tint imparted by the precipitated cuprous oxide. This difficulty is removed by Dr. Pavy's process, since the ammonia altogether prevents the precipitation of cuprous oxide, and in a clear solution the exact amount of sugar required to completely decolorise the cupric blue tint may be much more easily determined. The only precaution necessary is to completely exclude air during the determination, because a colourless ammoniacal cuprous solution is rapidly rendered blue by exposure to atmospheric oxygen, the cupric hydrate being thereby reproduced.

The Picric Acid and Potash Test for Sugar.—On November 18th, 1882, I stated that I had accidentally stumbled upon the fact that picric acid, when boiled with caustic potash, forms a most delicate test for glucose. I added some picric acid solution to a boiling specimen of diabetic urine, which had been previously mixed with liquor potassæ, and found, to my surprise, that the liquid at once assumed an intensely dark colour. I was not then aware of the fact that the reaction of picric acid with grape-sugar had been observed by Braun, a German chemist, nearly twenty years ago. In this paper, it is shown that grape-sugar, when boiled with picric acid and potash, reduces the yellow picric acid to the deep red picramic acid, the depth of colour depending on the amount of sugar present. I am not aware that hitherto any attempt has been made to utilise this as a qualitative clinical test for sugar in the urine, or as a means of accurately estimating the amount of sugar in a saccharine solution. I think, however, that, after having been the subject of much hostile criticism, the value of the test for both purposes has been completely proved and established.

I take a fluid drachm of a solution of grape sugar, in the proportion of a grain to the fluid ounce, mix it with half a drachm of liquor potassæ (*P.B.*), and forty minims of a saturated solution of picric acid, and make up the mixture to four drachms with distilled water. The mixture is conveniently made in a boiling tube, ten inches long and three-fourths of an inch in diameter, which should be marked at the height of four drachms. With a long boiling tube, there is little risk of the liquid boiling over; and the steam, condensing in the upper cooler part of the tube, flows back as liquid, so that there is little loss by evaporation. The liquid is now raised to the boiling point, and kept boiling for sixty seconds, so as to ensure complete reaction between the sugar and the picric acid. During the process of boiling, the pale yellow colour of the liquid is changed to a beautiful claret-red.

The liquid having been cooled by cautiously immersing the tube in cold water, we ascertain that its level is that of the four-drachm mark on the tube; and if found below the mark, it is

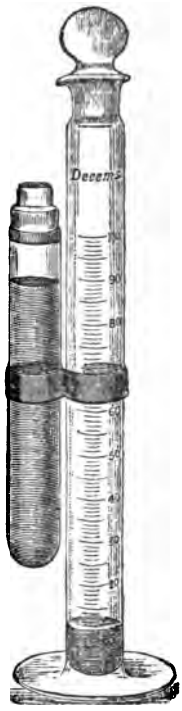
brought up to it by the addition of distilled water. The colour now is that which results from the decomposition of picric acid by a grain of sugar to the ounce four times diluted; in other words, it indicates one quarter of a grain of sugar to the ounce, and this colour is a convenient standard for comparison in making a quantitative analysis. The picramic acid solution, however, on exposure to the light even for a few hours, becomes paler; but the colour may be exactly imitated by a solution of ferric acetate with an excess of ferric perchloride, and a slight excess of acetic acid.

The following is the formula for the standard solution, for which I am indebted to my son, G. Stillingfleet Johnson, F.C.S.—Liq. ferri perchlor. fort. (sp. gr. 1·338), ʒ j; liq. ammon. acet. (sp. gr. 1·017), ʒ iv; acid. acet. glacial (sp. gr. 1·065), ʒ iv; liquor ammoniæ (sp. gr. 0·959), ʒ j; aq. destil. ad. ℥iv. Mix thoroughly the iron solution with the liq. ammon. acet. and the acetic acid, then add the liq. ammoniæ, and dilute up to four ounces. The ingredients are all of the strength prescribed by the Brit. Pharm. (This standard solution may be obtained from Messrs. Bell and Co., 225, Oxford Street, or Savory and More, 143, New Bond Street.)

The colour of this is equal to a quarter of a grain of grape-sugar to the ounce. When a fresh solution is made, it should be checked by comparison with a grain-solution of sugar, boiled with picric acid and potash, and four times diluted. I have here an iron standard solution, which was made six months ago, and which, having been kept for the most part in the dark, retains its colour unchanged. I have also a solution of grape-sugar, one grain to the ounce, in eighty per cent. of water and twenty per cent of rectified spirit, which has kept without change in an accurately stoppered bottle for the same period. The alcohol prevents the spontaneous decomposition of the sugar, but has no reducing action on picric acid.

If, now, a drachm of a solution of grape-sugar, containing *two* grains to the ounce, be mixed with the same quantity of liquor potassæ and picric acid, and made up to four drachms in the boiling tube, the result of boiling the mixture as before for sixty seconds will be the production of a much darker colour than when the one-grain solution was acted upon; but, if now the dark liquid be diluted with its own volume of water, the colour will be the same as that of the one-grain solution. The dilution is accurately done in a stoppered tube, twelve inches long and three-quarters of an inch in diameter, graduated into 10 and 100 equal divisions. By the side of this tube, and held in position by an S-shaped band of metal, is a stoppered tube of equal diameter, and about six inches long, containing the standard iron solution. (*See Fig.*)

Sufficient of the dark saccharine liquid to be analysed is poured in to occupy exactly ten divisions of the graduated tube. Distilled water is then added cautiously, until the colour approaches that of the standard. The level of the liquid is then read off and noted. A more exact comparison of the saccharine liquid with the standard is made by pouring into a flat-bottomed colourless tube, about six inches long and an inch in diameter, as much of the standard as will form a column of liquid about an inch in height, and an exactly equal column of the saccharine liquid in a precisely similar tube. The operator then looks down through both tubes at once, one being held in each hand, upon the surface of a white porcelain slab, or a piece of white paper. In this way, a slight difference of tint is readily recognised; and, if the liquid to be analysed be found to be darker than the standard, it is returned to the saccharometer, and diluted until the two liquids are found to be identical in colour, when the final reading is taken. The saccharine liquid having been diluted four times before it was boiled, a colour equal to that of the quarter-grain standard would indicate one grain of sugar per fluid ounce. If further dilution were required—say from ten to twenty divisions—the proportion of sugar would be two grains per ounce, and so on to thirty or forty or upwards, or to intermediate divisions. Thus, dilution from ten to thirty-five divisions would indicate 3·5 grains of sugar per ounce.



The Picro-Saccharometer (made by E. Cetti, Brooke Street, Holborn).—The shading of the side-tube indicates the ferric acetate standard. The darker shading at the bottom of the graduated tube shows the saccharine fluid, darkened by boiling with picric acid and potash, and occupying ten divisions, before dilution.

We have found, by experiment, that ten minims of a cold saturated solution of picric acid are rather more than sufficient for decomposition by one drachm of a solution of grape-sugar in the proportion of one grain to the ounce. A drachm of the solution would, of course, contain one-eighth of a grain of sugar. In making an analysis, the picric acid must be added in proportion to the amount of sugar. If the proportion of sugar be as high as six grains per ounce, a drachm of the picric acid solution will be required. If the proportion of sugar be

higher than this, the saccharine fluid should be diluted with distilled water, in a definite proportion, before commencing the analysis, and the product of the analysis of the diluted fluid is then to be multiplied by the degree of dilution—two, five, or ten, as the case may be, to which the original liquid has been subjected.—When the urine has been diluted ten times, the figures on the saccharometer indicate the number of grains per ounce. Thus, when the ten times diluted urine, after boiling with picric acid and potash, is further diluted from 10 divisions to 35, to obtain the standard colour, the amount of sugar is 35 grains to the ounce.

To reduce the amount of sugar per ounce to the proportion per cent., we have to remember that an ounce of water at 0° cent. weighs 437·5 grains. If now the proportion of sugar is 40 grains per ounce, then 437·5 : 100 : : 40 : 8·19.

Distilled water, or clear rain water, should be used for diluting. Hard water, containing salts of lime, is rendered turbid by the carbonate of lime precipitated by mixture with caustic potash, and any turbidity in the liquid interferes with the exact estimation of the depth of colour. In testing undiluted urine, a slight turbidity often results from separation of phosphates by the potash. This turbidity may be removed by allowing the phosphates to form a sediment, or more speedily by filtration. When a highly saccharine liquid is diluted five or ten times before mixture with the testing materials, no phosphatic turbidity occurs. In making a volumetric analysis, care must, of course, be taken that the measurements and dilutions are accurately made.—The preliminary dilution of a strongly saccharine specimen may be made in the graduated saccharometer; or, into a flask graduated to contain fifty cubic centimètres, five or ten cubic centimètres of the saccharine liquid may be delivered from a graduated measure or pipette; then, the flask being filled up to the graduation with distilled water, the dilution will be ten times with five cubic centimètres, and five times with ten cubic centimètres of the liquid to be analysed. Or, without any special apparatus, an accurately measured drachm of urine may be diluted up to five or ten drachms with distilled water.

Another important point is that, while the amount of potash remains the same, the picric acid must be in proportion to the amount of sugar in solution. It has already been mentioned that ten minims of the picric acid solution are more than equal to one-eighth of a grain of glucose, which is the amount contained in one drachm of a solution, in the proportion of a grain to a fluid ounce. A considerable excess of picric acid does not appreciably affect the colour of the picramic acid, while a deficiency would, of course, lead to an underestimate of the amount of sugar. If an analysis with forty minims of picric

acid solution indicate, say, from four to five grains of sugar, it is probable that some sugar has been left undecomposed; and a second analysis, with a larger proportion of picric acid, might therefore give a higher and more correct result. If, on the other hand, a second analysis, with a larger proportion of picric acid, give an identical result, we may feel certain that the whole of the sugar has been decomposed, and the amount correctly indicated by the resulting picramic coloration. In any case, when the amount of sugar indicated is less than would suffice to react upon the amount of picric acid employed, the result may be relied upon as correct.

The presence of albumen, even in large amount, has but little influence on the picric acid test for sugar.—When I first published to the profession my observations in picric acid and potash as a test for sugar, it was suggested that unoxidised sulphur-compounds in the urine, and especially in albuminous urine, would form an alkaline sulphide when boiled with potash, and this would decompose the picric acid and render the test fallacious. Experience has proved that these theoretical objections were quite groundless. My son proved conclusively that, when pure albumen is boiled with diluted solutions of potash, such as are used in testing for sugar, no alkaline sulphide is formed.

The accuracy of the picric acid method of volumetric sugar-analysis has been fully and fairly tested. Our plan has been to compare the results of this process with those obtained by Dr. Pavy's ammonio-cupric method. We have analysed the same specimens, many of them albuminous as well as saccharine, by the two processes, my son employing Dr. Pavy's method in the laboratory at King's College, and I the picric acid process at home; and our results are found to be practically identical, the differences being only such as are due to unavoidable slight errors in conducting an experiment. Both methods, in fact, are based upon the same chemical principle—namely, that glucose, when heated with potash in the presence of an oxidizing agent, has a tendency to rob it of its oxygen. In the one process, the reducing action of the sugar is exerted upon an oxide of copper; in the other, on picric acid. A definite weight of sugar reduces, in the one case, a proportional amount of cupric oxide, and in the other an equivalent proportion of picric acid, with resulting picramic acid and a corresponding measurable intensity of colour.

I claim for the picric acid and potash method of analysis that it is as accurate as any other, and that for the estimation of sugar in the urine it is even more accurate than either Fehling's or Dr. Pavy's process, because the picric acid is not acted on by uric acid or urates, which reduce the oxide of

copper. The method of analysis by the picro-saccharometer is at least as speedy and as easily acquired as any other. The materials and apparatus required are easily prepared, inexpensive, and not, like Fehling's copper-solution, liable to undergo rapid changes. The standard iron-solution, as I have shown, may be kept in the dark for months without the slightest change of colour; and a solution of grape-sugar in water, one grain to the ounce, with twenty per cent. by volume of rectified spirit, may be kept unchanged for an indefinite period, and used occasionally for comparison with the ferric acetate standard.—During the last nine months, I have tested with the picric acid and potash a large number of specimens of normal urine, with the almost uniform result of a depth of colour indicating the proportion of 0.6 grain of sugar in the fluid ounce, the indication usually varying between the limits 0.5 and 0.7 grain in the fluid ounce. In a considerable number of cases, my son has tested the same specimens by the ammonio-cupric method, with the indication usually of from 0.7 grain to 0.9 grain in the fluid ounce; *i.e.*, an excess of that obtained by picric acid of from 0.1 to 0.3 grain in the fluid ounce.

Since using the picric acid and potash test, I have so often found an excess of sugar in urine, when, from the comparatively low specific gravity, I should not have suspected it, that I now *invariably test for both sugar and albumen in every specimen of urine.* This double qualitative testing, which occupies less than two minutes, is done as follows. To about a drachm of urine in a test-tube is added an equal volume of a saturated solution of picric acid. If albumen be present, the liquid is rendered more or less turbid, and this turbidity is increased by boiling. Then half a drachm of liquor potassæ is added to the boiling mixture, the albumen, if present, is redissolved, and the boiling is continued for about thirty seconds. If sugar be present in the proportion of a grain to the ounce, the liquid will become darker than the quarter-grain standard, and two grains or more to the ounce will make the mixture black. The presence of an excess of sugar having thus been ascertained, the actual amount may be speedily and accurately determined by the quantitative method of analysis before described.

Bedside Testing.—For bedside sugar-testing, I carry in my pocket-case, in addition to powdered picric acid, grain-lumps of caustic potash, and a test-tube which is graduated up to three drachms. I put into the test-tube about a third of a grain of picric acid, as much as can be carried on the point of a penknife; then with the nipple pipette, or without it, half a drachm of water. The acid is dissolved in the water by the heat of a lamp or candle; now half a drachm of urine is added,

and the presence or absence of albumen is ascertained; next a grain-lump of caustic potash is added, and the liquid is boiled for a few seconds. In normal urine the resulting colour will be somewhat darker than the quarter-grain standard until dilution with water is carried up to the twelve minim mark above the drachm, indicating 0.6 grain per ounce. If the colour be still darker, more water is added. If dilution to two drachms gives the quarter-grain standard colour there is one grain to the ounce, the urine having been diluted from half drachm to two drachms; dilution to the three-drachm mark would indicate one and a half grain per ounce. If the colour is still darker than the standard the urine must be diluted before it is tested. This may be done by means of the nipple pipette which is graduated from five minims up to thirty minims. Thus five or ten minims of urine may be diluted up to ten or twenty or more times the volume with water. The diluted liquid is then tested in the small graduated tube, and the result multiplied by the number of dilutions. If after boiling a ten times diluted urine, as directed, with picric acid and potash, the standard colour is reached by dilution to the one-drachm mark, there will be five grains of sugar per ounce. If dilution up to two drachms is required, the amount will be ten grains; to the three-drachm mark fifteen grains, and for the intermediate dilutions the amount may be estimated with a near approach to accuracy.

The Indigo-Carmine Test.— Dr. Oliver has recently had papers prepared by drying after immersion in a solution of indigo-carmine with carbonate of soda. These papers form a delicate qualitative test for sugar. A paper is placed in a test-tube and covered with distilled water; heat is then applied until a blue solution is formed. A drop of diabetic urine is then added, and the heating continued. The solution changes from blue to violet, purple, red, yellow, and finally straw colour. After cooling and exposure to the air, the liquid passes back through the various colours into the original blue. The delicacy of the test is increased by using a carbonate of soda paper with the indigo-carmine paper. This paper-test, delicate and easy of application as it is, is not more so than the picric acid and potash test before described, and, so far as we at present know, it affords but an imperfect indication of the amount of sugar.— *Dr. Johnson, pp.* 23-54.

SURGERY.

FRACTURES, AMPUTATIONS, DISLOCATIONS, AND DISEASES OF THE BONES, JOINTS, ETC.

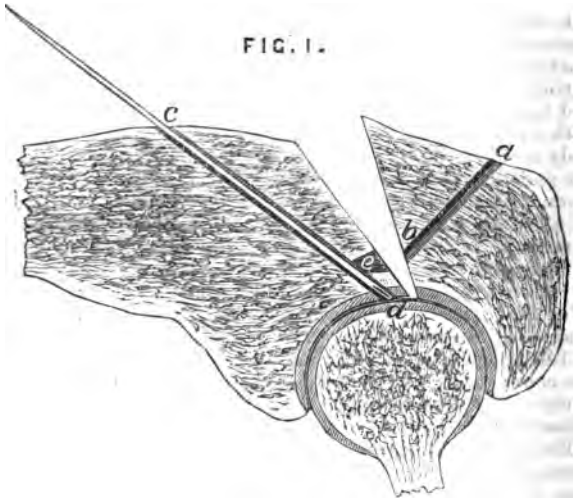
30.—ON THE TREATMENT OF FRACTURE OF THE PATELLA.

By Sir JOSEPH LISTER, Bart., F.R.S., &c., Professor of Clinical Surgery in King's College.

In March, 1873, my friend Dr. Hector Cameron of Glasgow recommended to my care, in the Edinburgh Infirmary, a case of ununited fracture of the olecranon. Dr. Cameron had formerly been my house-surgeon in the Glasgow Royal Infirmary, and I had afterwards for several years the great advantage of his assistance in private practice; and he reminds me that I had often expressed to him the opinion that the use of a metallic suture, antiseptically applied, which we had employed in ununited fracture of the shafts of the long bones ought to be extended to the olecranon and patella. The patient to whom I refer presented himself to Dr. Cameron as an out-patient, and as he could not at that time operate himself, he sent him to me. He was a man thirty-four years of age, who five months previously had received a blow from a policeman's *bâton* on the left elbow. This occasioned great swelling, which seems to have concealed the true nature of the case from the surgeon whom he first consulted. On admission, there was a considerable interval between the olecranon and the shaft of the bone, and although the limb was muscular, it was comparatively helpless, as he could not extend the forearm at all without the aid of the other hand. On March 28th, I made a longitudinal incision, exposing the site of the fracture; and having pared away the fibrous material from the fractured surfaces, I proceeded to drill the fragments in order to apply the suture. The fracture was oblique from before backwards, as shown in Fig. 1. I found no difficulty with the proximal fragment in making the drill appear upon the fractured surface at a little distance from the cartilage (see *b*, Fig. 1); but with the other fragment the obliquity of the position in which the drill had to be placed was so great that, instead of emerging at the fractured surface, as I had intended, I found it had entered into the substance of the humerus (*d*, Fig. 1). I therefore withdrew the drill, and substituted for it a needle (*c*, *d*). Then with a gouge I excavated an opening

(*e*) upon the fractured surface opposite to the drill-hole (*b*) on the other surface, until the needle was exposed. Withdrawing the needle, I introduced a silver wire in its place, and had no

FIG. 1.



difficulty, by means of forceps passed into the excavation made by the gouge, in drawing out the wire. I was then able to pass it on through the other drilled opening, and thus the two fragments were brought into apposition. The ends of the wire were twisted together, and left projecting at the wound. Healing took place without suppuration or fever, and the wire was removed on May 19th, seven weeks after the operation. The wound made for its extraction soon healed, and the patient returned to Glasgow; and I afterwards had the satisfaction of learning that he was wielding the hammer in an iron shipbuilding yard with his former energy.

I have had two other cases of ununited fracture of the olecranon; and as these are closely allied to the subject of my paper I may refer briefly to them. One was a man, forty-five years of age, incapacitated for his occupation as a plasterer by inability to extend the right elbow completely. The ununited fracture of nine weeks' standing was oblique laterally. It was treated as in the last case, the operation presenting no difficulty. It was performed on March 20th, 1878. The wound healed without suppuration, but the wire was not completely removed; for, the loop having given way near the twist, the twisted part

was alone taken way, and the loop left behind. It never caused any inconvenience, and he afterwards wrote to us from his home at Bristol that he was able to follow his old employment.

The third case was that of a gentleman, thirty-three years old, who had consulted no fewer than eighteen surgeons on account of the weakness of his left arm, caused by ununited fracture of the olecranon. I operated on July 28th, 1881, paring the broken surfaces as in the other cases, using a chisel and hammer for the purpose; and having drilled the fragments with a common bradawl, I brought them together with moderately stout silver wire. In this case, however, I did not leave the ends of the wire projecting from the wound; but having given them one complete twist (or two half twists), cut the ends off short and with a small hammer hammered the twisted part down flat upon the ulna. The advantage of this practice was strikingly exemplified by the difference in the course of this case from its predecessors. Instead of keeping him under treatment for several weeks until the wire could be removed, I was enabled to allow him to return fifteen days after the operation to his home in Wales with a sound cicatrix, and, trusting to the connecting loop of wire, permitted him to use the elbow freely. I afterwards learned that he was able to drive a four-in-hand as well as ever.

The practice of cutting the ends of the wire short and hammering down the twist upon the bone is one to which I shall have to refer again in connexion with my later cases of fracture of the patella. It is in every respect an advantage. The hammering down of the twist renders it more secure than if it is left projecting, to be moved by every shifting of the dressing, and perhaps broken, as in the second of the cases just referred to. We also get rid of a source of disturbance, and sometimes of considerable uneasiness, in the wound. The time of healing is greatly shortened; and the knowledge that the loop of wire securely holds the fragments in position allows the use of the joint to be commenced much earlier than when we have only the organic band of union to trust to. The practice is also of the highest value in ununited fracture of the shafts of the long bones. The thickness of the wire must be proportioned to the force to which it is to be subjected. For the olecranon, only about one twenty-fifth of an inch in diameter is amply sufficient. For the shaft of a femur of an adult male, a piece of wire, about one-tenth of an inch in thickness is requisite in order to resist with certainty the enormous force of the great muscles of the thigh. The pieces of bones which I hold in my hand were removed in August, 1881, from a case of badly united fracture of the femur. The patient was a gentleman from Rio de Janeiro. The fracture had occurred about the junction of the middle and

upper thirds of the bone; it had been so badly united that the fragments overlapped very much, and also were at a considerable angle with each other, so that the limb was extremely distorted as well as much shortened. Bloodlessness of the operation having been provided for by elevation of the limb and the application of an elastic tourniquet, I cut down from the outer aspect of the thigh upon the seat of fracture. Then with a periosteum detacher I separated the soft parts from the place of junction of the fragments, and in the next place I went through the extremely laborious process of cutting through the osseous union (which was of almost ivory hardness) parallel to the axes of the two overlapping fragments. This having been at length accomplished, and the soft parts still further detached, I found I was able not only to get the limb into a straight position, but also by a very moderate extension so to reduce the riding of the fragments that by sawing off comparatively small portions I was able to bring their extremities into apposition and apply my suture. This was done with wire of about this same thickness. The limb was put up at first with a long splint. Being a weakly man, it was some months before absolutely firm union was obtained. It would have been extremely embarrassing to have had the ends of the wire sticking out from the wound all that time. On the contrary, it was a very great comfort to have no occasion to think about the wire; and ultimately he left for South America with a perfectly straight limb, almost of the same length as the other, and with thoroughly firm union established.

1. *Transverse Fracture of Patella.*—In October, 1877, a patient with transverse fracture of the patella was admitted under my care into King's College Hospital. He was a man, forty years of age, who, while riding, was thrown over the horse's head, and fell on the right knee. He could not rise, and was brought to the hospital. In the first instance, I attempted with this patient to bring the upper fragment down so that it should be in contact with the lower. For this purpose I applied an apparatus, which was so arranged that the upper fragment could be drawn down by means of weights and pulleys. Four days later, however, I found that there was still a quarter of an inch interval between the fragments, and I suggested the operation of cutting down and applying the wire suture. This, however, he would not then consent to, and preferred returning home to be under the care of his ordinary medical attendant. Eight days later, or fourteen days after the accident, he was re-admitted, expressing a wish to be operated upon. On October 26th I accordingly proceeded to operate, making a vertical incision about two inches in length over the patella, exposing the fragments, which were then one inch apart. My inability

to bring down the upper fragment into contact with the lower became explained when the parts were exposed; for there were found between the fragments exceedingly firm coagula, with fibrous tissue, fascial and periosteal, mingled with them. The clots having been cleared away from between the fragments and from the interior of the joint, I applied a common brad-awl in the middle line of the patella, drilling each fragment obliquely so as to bring out the drill upon the broken surface a little distance from the cartilage. Pretty stout silver wire was then passed through the drilled openings and the fragments brought accurately into apposition. Before they were brought together, however, an arrangement was made for the drainage of the joint. This was done on the same principle in all the cases that I have to record, and I may therefore describe the matter once for all. A pair of dressing forceps with the blades closed were passed through the wound to the most dependent part of the joint at its outer aspect. The instrument was then forcibly thrust through the synovial membrane, the fibrous capsule, and the fascia, until the point of the forceps was felt under the skin. An incision was next made with a knife through the skin upon the end of the dressing forceps so as to allow it to protrude. The blades of the forceps were then expanded so as to enlarge the opening which they had made in the deeper structures without risk of causing hemorrhage. The drain was then seized in the forceps that protruded through the wound and drawn into the joint. The ends of the wire were now twisted together and the twisted ends brought out at the wound, which was closed with sutures and a small drain inserted. The limb, enveloped in an antiseptic dressing, was placed in a trough of Gooch's splint, with the upper end oblique, corresponding to the line from the tuberosity of the ischium to the great trochanter, and the lower end excavated in the form of a horseshoe, while the horns of the horshoe were well padded to support the sides of the foot. It is unnecessary for me to enter into details as to the progress of this case. The temperature chart indicates, you observe, after a little temporary disturbance immediately after the operation, an entirely afebrile condition. The wounds healed without any suppuration. At the end of eight weeks the wire was removed by an incision through the cicatrix. Eight days later the wound made for the removal of the wire had healed. At the end of ten weeks from the operation the patient was allowed to get up; and though no passive motion had been employed he could move the limb freely through an angle of about 30°. Two days later he was discharged, and, unfortunately, nothing has been heard of him since. This, I believe, is the first instance of a recent case of fracture of the patella being treated by wire suture antiseptically applied.

2. *Transverse Fracture of Patella.*—William T——, a coal porter, thirty-seven years of age, a muscular man, was admitted on Dec. 13th, 1879. He slipped on Dec. 9th, while carrying a sack of coals, and felt something give way in one knee. On endeavouring to rise he found himself unable to do so. The right patella was found fractured transversely, the interval between the fragments being about an inch. There was a considerable amount of effusion into the joint. On Dec. 15th—that is to say, six days after the accident—I proceeded to operate, making a longitudinal incision, as in the last case, about two inches long, over the patella. The lips of the wound being held apart with blunt hooks, a hole was drilled in each fragment in the median line; stout silver wire was passed and secured by four half turns. A drainage-tube was introduced, as in the last case. For the first fortnight after the operation there was what we may call an absolutely afebrile state; during the rest of the time of his residence in the hospital there were two accidental elevations to 100·5°, but nothing to indicate anything serious. The wound healed, as in the last case, without any suppuration. Six weeks after the operation he was allowed to get up. Eight weeks after the operation an incision was made through the cicatrix for the removal of the wire, the loop of which was cut and the wire withdrawn. On Feb. 23rd—that is, a fortnight later—the bandages which had been previously applied to the leg were removed, and it was found that he could bend the limb to a right angle, he could walk well, and was able to kick. On Feb. 22nd, 1883, this patient showed himself. We then took the following notes:—"The patella seems perfectly natural, except a trifling irregularity of outline on one side. It is evidently osseously united. The movements of the joint are perfect, from complete flexion to extension. He can kick vigorously. He says the joint is just as trustworthy as ever. He frequently carries a weight of 220 lb. for upwards of 100 yards, and he walks without the slightest limp." [The patient was introduced and exhibited. He said his limb was as good as ever, and that it never failed him.] Except for the linear cicatrix, no one would be able to tell that this patient had had anything wrong with his knee at all.

3. *Ununited Fracture of Patella.*—The next case was one of ununited fracture. The patient, Joseph R——, aged twenty-two, was admitted into the hospital on Sept. 27th, 1880. He is a soldier, and stated that on June 3rd of that year, while running across a green he slipped upon a piece of turf, and in trying to recover his balance he snapped his knee-pan and fell. He was taken to a military hospital, and the limb was put in splints, which were kept on for seven weeks, a starched bandage being

applied after their removal. On admission, the fragments were found separated by an interval of three-quarters of an inch. There was a firm fibrous band of union between them. The knee, however, was quite stiff, in consequence, apparently, of the rigidity of the extremely atrophied quadriceps extensor. He was quite unable to walk; if he attempted to do so he held the leg in his hand, and he complained of uneasy feelings in the joint. On Oct. 22nd I cut down over the patella as in the former case, and having cut away the fibrous tissue between the fragments, refreshed the osseous surfaces, and then, having provided for drainage as before, drilled the fragments and drew them together with stout silver wire. Nothing occurred worthy of any notice until four weeks after the operation, when I proceeded to attempt passive motion. Without chloroform this proved impossible; but under chloroform I used considerable force, when, the rigid quadriceps refusing to yield, the twist of the wire gave way; the cicatrix, which had quite healed except where the wire projected, opened, and there was heard a sound of air being sucked into the joint, the fragments becoming at the same time widely separated. I injected the joint with an antiseptic solution, a procedure which I candidly confess I should now regard as probably superfluous. However, such was done; and six days later, when all disturbance caused by this second injury and the irritation of the antiseptic injection had passed off, I operated upon him a second time. Chloroform was again administered, and the cicatrix was laid open. I then found that the ends of the wire were lying in place ready to be twisted together. I found at the same time a considerable mass of coagula present. These I cleared away from between the fragments and from the joint, twisted the wire again, and thus we had a second operation in one patient. The after progress was as in the other cases. Here we have a doubly long temperature chart, because we have two cases in one, so to speak; but it will be seen that here there has been no deviation whatever from the normal state; neither as the result of one operation nor the other has any febrile condition as regards temperature been produced. In due time the wire was removed, and the wound made through the cicatrix having healed, he was discharged, eight weeks after the second operation. He was then able to walk, but with a stiff knee, with scarcely any mobility. I did not attempt any more passive motion after previous experience, and, while I was well pleased to see that he could walk with a stiff knee, whereas he could not walk at all on admission, I hardly ventured to hope for anything better. However, on Feb. 22nd, 1883, he presented himself, when we made the following report:—"The patella is perfectly natural, except a little irregularity of the two

borders opposite the seat of the fracture. The surface is quite smooth. There is no interval between the fragments. There is evident osseous union. The degree of flexion is increasing. He can bend to an angle of sixty degrees and extend completely. He laid aside his stick last summer and returned to his work as a gardener seven months ago. He can do anything except kneel. In getting over a paling, he has to throw the leg over in a partially extended position. He walks with a barely perceptible limp." We may now say that he walks with no limp at all. [The patient was introduced and exhibited. He said he could work very well, that he was on his legs all day and felt no uneasiness.] The great interest in this case seems to me to lie in the improvement that has occurred without any passive motion on the part of the surgeon merely from the natural actions of the limb.

4. *Ununited Fracture of Patella.*—The patient, Martha F——, aged forty-three, was admitted November 5th, 1880, on account of an accident which had happened eight weeks before, when she felt something snap in her knee while trying to save herself from falling. She was unable to walk or move the joint, which quickly swelled to a large size. No splints had been used, and no treatment of any kind employed. On admission there was fulness over the knee, and a transverse fracture of the patella was discovered in the middle of the bone. The fragments were separated one inch. There was fluid in the joint, as indicated by fluctuation. On Nov. 12th I operated as in the last case, paring away the fibrous material between the fragments and refreshing the osseous surfaces with cutting pliers. The fragments were then drilled obliquely in the middle line, and brought into apposition by means of stout silver wire. This, however, could only be done when the limb was raised high into the air, so as to relax the quadriceps, she being a stout woman with powerful muscles. With regard to this patient, again, I have to show a temperature chart free from any febrile indication. In eight weeks after the operation the patient was allowed to get up, and she walked about on crutches. She was discharged three weeks later, able to bend the knee slightly, lowering and raising the foot three or four inches. On the 14th of February the patient was re-admitted to have the wire extracted; and five days later she was finally discharged. It will be remembered this was a case of ununited fracture, and that when the patient left the hospital she could only move the foot for a distance of about four inches. But on February 22nd of this year, when we had an opportunity of seeing her, the following note was taken:—"There is perfect union of the fragments. She can walk from Drury-lane to Billingsgate and back, and walks without a limp. She can

bend the knee to a right angle, and says the mobility increases every day. From the position at a right angle she can raise the leg in a perfectly natural manner to the extended position. She is a stout, heavy woman. She cannot kneel." [The patient was introduced and exhibited. There seemed to be a perfect patella; nothing abnormal to be felt about it. She said she could do everything except kneel.]

5. *Recent Transverse Fracture of Patella.*—Wm. G——, sixty-two years of age, was admitted June 21st, 1881; he is a healthy man, but a pretty hard drinker. On the morning of his admission he slipped, put out his right leg to save himself, fell, and could not rise. His leg doubled under him. On admission the patella was found fractured transversely, with one inch of interval between the fragments, which could be brought together with difficulty. The knee was considerably swollen. On the 24th—that is, three days after the accident—I operated upon him. The operation was conducted precisely as in the recent cases that have been before described, except that in this patient, for the first time, the ends of the wire were cut short, and the twist hammered down. A few hours after the operation he became delirious, and we were apprehensive of delirium tremens. However, he was quieted with a dose of opium, and gave no further trouble. The temperature chart here, as in the last case, exhibits entire absence of febrile indication. The wounds healed without suppuration. Exactly six weeks after the operation he was allowed to get up, and I had the satisfaction of exhibiting him before some of the members of the International Medical Congress, and showed them that he could raise his limb from a position of flexion almost at a right angle to the completely extended posture. I have not seen him from that time until to-day. Having learned that he was employed in a Birmingham establishment, I wrote to my friend Mr. Chavasse, of that city, and I received from him this letter: "I saw G—— this morning, and have made arrangements for him to leave by the two o'clock train to-morrow afternoon. In case he should not keep his appointment, there is a faint linear cicatrix present over the joint. The knee can be flexed as well as the other. There is bony union of the patella, a faint ridge being felt at the point of union. No suture is to be detected by the touch. At his work as a stamper all day long he works a pulley with the affected limb, which raises a weight of 60lb. In damp weather he feels very slight inconvenience in the site of the old fracture." Happily our patient has kept his appointment, so that we are able to see him to-day. [The patient was introduced and shown. He said he could do anything with the limb, the same as with the other. He worked a stamp-hammer, and he could work that hammer,

weighing 1 cwt., all day long. There was no difference whatever between the movements of the two knees. There was a barely perceptible cicatrix, and a perfect patella.]

6. *Recent Fracture of Patella.*—Elizabeth C——, fifty-seven years of age. She also was a recent case, admitted on Oct. 21st, 1881. Going downstairs she fell, with her left leg bent under her, striking the knee against the ground. She was brought at once to the hospital. The left knee was very much swollen from effusion, hot and tender; the fragments of the patella were felt separated from each other about one inch. I believe it is generally wise to let any distinct inflammatory appearances that exist as the immediate result of the accident pass off before the operation. In the former case there were no such, or scarcely any; therefore we operated three days after the accident. In this case they were manifest, and we allowed a week to pass. The operation was performed just as in the last case; the ends of the wire were twisted with two half turns—that is to say, one complete turn; the ends were cut short, and then with the small hammer the twist was hammered flat down upon the patella. On the evening of the first day there was a depression of temperature; on the following day a little rise—to 101°; after that there was nothing to indicate anything febrile. Two weeks after the operation passive motion was commenced; the wounds were then so very nearly healed that the milder antiseptic boracic lint was used for the superficial sore which remained. Three weeks after the operation the limb was bent to a right angle; this was painful to her, but caused no disturbance of the fragments. Four weeks after operation passive motion was again employed; the wounds were completely healed. Six weeks after the operation the patient was allowed to get up and could already walk fairly. Three days later she was discharged; she could then walk very well. On Feb. 23rd last we took this note regarding her:—"The patella appears perfectly natural with the exception that the wire is felt, causing the slightest projection under the skin, which, however, moves freely over it. The movements of the joint are perfect from complete flexion at a very acute angle to perfect extension. She kneels as she used to do, and only occasionally the wire comes into contact with anything, and then she feels the skin over it tender. She can walk any distance, as before the accident, and does so without a limp." [The patient was now introduced, and fully confirmed the previous report.]

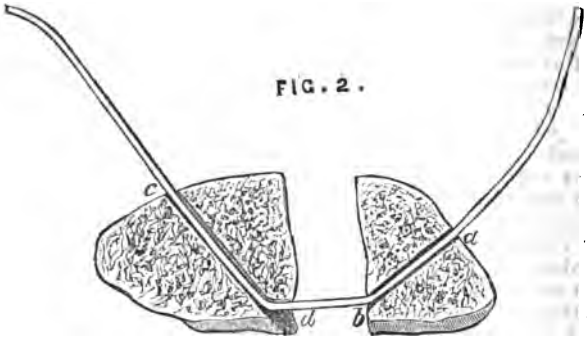
7. *Recent Transverse Fracture of Patella.*—My last case is a man sixty-seven years of age, John P——, admitted into King's College Hospital on Jan. 6th, 1883. He had fallen from an omnibus on the previous day, striking his knee upon the ground.

There was transverse fracture of the patella, and great swelling of the joint. Six days after the accident I proceeded to operate. On exposing the seat of fracture, I found a condition of things which possibly, had I known it, might have induced me to abstain from operating. The lower fragment was very small, and was comminuted. There was one entirely loose piece as large as a filbert, and another about half that size. which of course had to be extracted. Such a condition, taken in connexion with the advanced age of the patient, did not promise well for satisfactory union. Having sponged the clots out from between the fragments and from the joint, and established a drain, I drilled; but as the lower fragment was so exceedingly small, I was obliged to drill, not through it, but through the ligamentum patellæ, and by this means was able to bring the large upper fragment into contact with the raw surface below. You will see that his temperature chart is free from any febrile indication; and the wounds healed without any suppuration. Here, as in the last two cases, the ends of the wire were cut short, and the twist hammered down upon the patella. Three weeks and four days after the operation the wound was nearly healed. The knee was bent to an angle of 30°, and from that position the patient could himself raise it to complete extension—a thing which without the wire, and without our feeling that the wire was in a very secure form, we should not have thought of permitting. Four weeks after the operation the wound was healed. The knee was then bent to an angle of 40°. Eight weeks after the operation the patient was discharged, having been for a considerable time before allowed to walk about the ward, and walking well. You will observe that this patient has not had the same time for improvement that the others have had. [The patient was introduced and examined. He said he was getting on "first-rate;" he found the leg continue to get stronger, and he was able to move it better; he noticed that it was getting stronger every week—he might say every day.] I confess I am surprised to see how complete a patella this man has, considering how extremely small the lower fragment was.

These are all the cases which I have operated upon, and I consider it fortunate that I am able to bring before you six out of the seven. I should like now to say a few words as to the method of operating. There is very little indeed to be added to what I have already said, except this: It is very desirable that the lower surface of the patella should be left quite smooth. We cannot be perfectly sure when we drill that the bradawl will come out exactly at a corresponding point on the two surfaces. Supposing that on one side the instrument should have come out too far down, it may be into the cartilage (as at *d* in

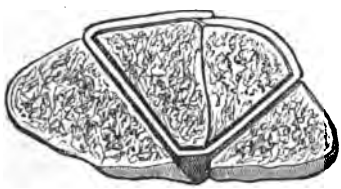
Fig. 2); we do not regard that at first, but pass the wire through the two drill-holes, and then on that side on which the

FIG. 2.



hole has come too far down, by means of the bradawl we simply chip away a little of the material that is above the wire until the wire comes to be in a position exactly opposite to the hole on the other side, leaving a gap below, as indicated by the dark shade at *d*. This is a perfectly simple matter; at the same time it might possibly not occur to anyone doing the operation.

FIG. 3.



Here we have the wire represented twisted and the twist hammered down. The twist always goes to one side, and being on the other side in this instance is not shown in Fig. 3.

I think it must be admitted that these cases show that the mode of treatment which I have recommended, when applied to recent transverse fractures of the patella, affords a means of restoring the joint to practically a perfectly natural condition, provided that no disaster occurs. But that is a tremendous proviso, and no one is more conscious of it than myself. Before I made the incision in the first case that I have recorded to-night, I remarked to those who were assembled in the theatre that I considered no man justified in performing such an operation unless he could say with a clear conscience that he considered himself morally certain of avoiding the entrance of any septic mischief into the wound. Supposing, on the other hand, that a man can say that with a good conscience, then I conceive that he is not only justified but bound to give his patient the advantages that we see are to be derived from this method of

procedure. We know, of course, quite well that by ordinary means of treatment patients often recover with very useful limbs. Every now and then osseous union is obtained. It is a thing which I used to pride myself formerly on striving to get, and I have achieved such a thing, but it was rare, and it was obtained by a very tedious process; and if ligamentous union occurred, we never felt sure that what was a very short ligamentous union when the patient was discharged might not be a long ligamentous union at a later period.

As regards antiseptic treatment, I should just like to make this remark: that nowadays it is not a very complicated business, either in theory or in practice. First, as to theory. We do not require any scientific theory in order to believe in antiseptic treatment. You need not believe in the germ theory at all; if you are not convinced of the truth of the germ theory of putrefaction and of septic agencies generally, no matter whatsoever, with reference to antiseptic practice, all you have to believe is that there are such things as putrefaction and other septic agencies, that our wounds are liable to these, that they are very pernicious, that these things come from without, and that we have the means of preventing them by various chemical agencies. That is all that we require, and I think anybody who knows the present state of surgical practice must admit these to be truisms. It has sometimes been a great grief to me to think that because gentlemen are not convinced of the truth of the germ theory out-and-out, therefore they lay aside antiseptic treatment altogether. And then as to practice. It is not a very difficult thing to wash your hands in a carbolic solution and have your instruments in this carbolic solution for a quarter of an hour before you operate. It is not a very difficult thing to wrap round the limb a suitable envelope of antiseptic material. What I believe to be one of the most important things of all is strictly to maintain this rule inviolate, which I insist upon with my dressers, and which I confess I have insisted upon more of late years than I used, and that is always when we change a dressing, invariably first to cover the wound with something pure;—not to wash the surrounding parts with antiseptic solution, and then, after this has been done, put a dressing on the wound, but before we begin to defile our lotion at all, put on the wound what is pure, and last thing of all wash the surrounding parts, which, though they look the same to our eyes, are different, *toto cœlo*. The edges of the dressing are septic—the wound, if it is as it ought to be, is aseptic. I have known such a thing, for instance, as for a gentleman in dressing a stump after amputation of the thigh to wash the perineum with a rag dipped in the carbolic

lotion (1 in 40) and then, having washed the perineum, immediately to squeeze this rag over the wound. That makes you laugh; but I assure you these are the kind of things that are constantly occurring; and disasters happen in consequence; and then gentlemen with whom things go wrong invariably say that with them everything has been perfectly done—a thing which for my part I am always loth to say.—*Lancet, Nov.* 3, *and British Med. Journal, Nov.* 3, 1883.

31.—THE TREATMENT OF FRACTURES OF THE PATELLA: By the EDITOR OF THE LANCET.

Few more important discussions have been held at our medical societies than those on the Treatment of Fractures of the Patella at the Medical and the Clinical Societies respectively. Not only are the principles of surgery involved in this question, but also those of ethics, and hence it has come about that very special interest has been excited. Although Prof. T. Cooper of San Francisco, in 1861, seems to have been the first to apply a metallic suture to the fragments of a broken patella, it may yet be said that to Sir Joseph Lister belong the credit and the responsibility of re-introducing to the profession this method of treating the injury. It consists in making a free incision into the knee-joint, drilling the two fragments, and uniting them by a stout silver wire, the ends of which are left hammered down on to the bone. A drain is provided at the outer side of the joint, and all the steps of the operation and after treatment are conducted upon those special lines which will always be associated with Sir Joseph Lister's name. Passive motion is begun at the end of about six weeks, and in favourable cases the result is a bony union of the fracture and a knee-joint in all particulars the same as before the injury. If the operation is performed in all cases of badly united fracture, it is often very difficult to get the fragments into exact apposition, and division of the fibrous and muscular structures connected with the bone may be necessary. Not only does this complicate the operation, but the final results are liable to be less good even in the most successful cases. All these points are well set forth and illustrated in Dr. Macewen's valuable lecture (see article 32) in which he advocates the performance of the operation at an earlier date than does Sir J. Lister, and recommends it also without the latter's expressions of caution. It must be clearly understood that the first and chief element in the success of this operation is that it shall be aseptic from first to last. The other technicalities of the procedure do not present any special difficulties—certainly none that a surgeon at all accustomed to operate would in any way fear. Sir Joseph Lister and his sup-

porters urge that the operation should be performed in recent rather than in old cases of injury, as the results are then more favourable; and they recommend it because the results obtainable by this means are in their opinion distinctly better than can be obtained by other treatment, and the operation may be conducted with only a minimum of risk, and even with a "moral certainty" of entire freedom from danger. The superiority of the result claimed for this procedure consists first in the bony union of the fragments and the complete restoration of the bone; and, secondly, in the shortness of the time necessary for the entire treatment, which is measured by weeks rather than months.

In opposition to this view it is alleged: (1) That other modes of treatment, when carefully and patiently carried out, are successful in the great end of securing a thoroughly useful limb. In this connexion Mr. Bryant produced a list of cases taken quite at random from the case-books of Guy's Hospital, which go far to support this assertion. (2) That bony union is no advantage over a close and firm fibrous union. This view was urged by Mr. Morris, who adduced in its support the fact that in cases of refracture it is always the bone that breaks, and not the ligament that separates. (3) The ordinary treatment by splints and bandages is entirely devoid of danger to life; this is incontestible. Sir J. Lister asserts that he does not expose his patient to any risk by operating. The list of cases collected by Mr. Turner conclusively proves that Sir Joseph's more or less close imitators cannot do the same, suppuration, anchylosis, and even death having followed in not a few cases. We must not on that account hurriedly conclude that Sir Joseph in his confident expressions is using the words of thoughtless exaggeration. He claims to have made it clear that all septic diseases in wounds made by the surgeon are preventible; but that they are only preventible by successful attention to a great number of details, the neglect of any one of which may be fatal. It is absurd for anyone to pretend to be able to master all these details without long, patient, and minutely careful study and practice. The other details of wound treatment—the arrest of hemorrhage, adaptation of flaps, and so forth—are so easy that it is readily to be understood how surgeons have come to think that *everything* in connexion with wound treatment should and must be equally simple. But all experience shows that the practice of aseptic surgery with anything approaching to uniform success is an art only acquired by long apprenticeship. Obviously this apprenticeship has not been served by all the surgeons who are called upon to treat broken patellæ, and there is no operation which more imperatively demands ascepticity from first to last than the opening

of a healthy joint for any purpose whatever. (4) It is argued, finally, that the operation is the best procedure in those cases of badly united fracture of the patella in which the subject is unable to follow his or her usual employment—cases in which the separation is wide, and the uniting material is weak or perhaps absent. Quite admitting the risk to limb and life, Sir J. Lister's opponents yet say that in such cases the probability of gain not otherwise attainable fully warrants the surgeon and the patient in running the risk. They insist, however, that these cases would never be seen if proper care were taken in their primary treatment; and that certainly any surgeon who failed in this far simpler duty would be quite unqualified to undertake the graver one of performing the metallic suture. Sir Joseph Lister, on the other hand, while not withholding the operation from these secondary cases, for the reasons already given, considers them far less suitable subjects than the primary.

This we believe to be an impartial statement of the points at issue in the discussion. To what conclusions does an equally impartial consideration of them lead? We think to these:—1. That the operation is not suitable as a primary measure. 2. That in view of its dangers, and of the good results obtained by other and perfectly safe methods of treatment, it is not commendable for general employment. 3. That it is not justifiable unless performed with every known precaution for securing an aseptic course of the wound; and that, in view of the difficulties of *ensuring* this, only those who have had considerable experience and success in this department of surgery should ever undertake it. 4. That greater pains should be taken in the treatment of primary fracture of the patella to secure close approximation of the fragments and to prevent stretching of the uniting material until it has become quite dense and firm. 5. That where simpler measures have failed to bring the fragments into tolerable proximity, this operation should be performed at the earliest possible time—say, a month after the primary injury.

We look for at least two valuable outcomes from this discussion: the first, greater care in the ordinary treatment of this injury; the second, increased interest in a mode of treatment that can show such results as those given by Sir Joseph Lister, leading to more determined efforts to acquire a thorough mastery over the processes of wound-healing, at least so far as the prevention of all septic infection is concerned.

Perhaps we have not yet witnessed a greater testimony to the change which has come over the treatment of wounds within the last fifteen years—the chief share in the credit for which undoubtedly belongs to Sir Joseph Lister—than the

very fact of this discussion. Less than a generation ago it would have been impracticable, and anyone who would have proposed such an operation would have been regarded with distrust. Now the suggestion commands serious discussion, and the strongest epithet applicable to its author would be that of "enthusiast," which has, after all, been the proud title of some of the world's greatest benefactors.—*Lancet, Nov.* 17, 1883, *p.* 865.

32.—ON FRACTURES OF THE PATELLA AND ON THE CHIEF CAUSE OF WANT OF OSSEOUS UNION IN TRANSVERSE FRACTURES, AND HOW TO OBVIATE IT.

By WILLIAM MACEWEN, M.D.Glas., Surgeon to the Royal Infirmary and Children's Hospital, Glasgow.

There are two causes generally assigned for the frequent want of osseous union of the patella. First, the separation of the fragments by the powerful contractions of the quadriceps extensor muscle; and second, fluid accumulating in the joint, such as blood or serum, causing distension and separation of the fragments. Though these causes do obtain in some cases, yet I have seen others where there was no distension of the joint by either blood or serum; where there was no blood detectable between the fragments on external manipulation; where, during the whole treatment, the extremities of the bone have been kept closely together, and yet bony union was not obtained. Such cases led me to the belief that there was a further cause for the want of osseous union in transverse fracture of the patella. It could not be due to a want of nutrition, nor to a deficiency of ossific reproduction inherent in the patella, as in certain diseased conditions of the patella the ossific deposit is abundant. While seeking for an explanation of this point, I had the opportunity of examining a man who had been accidentally killed by a fall from a roof, and who had sustained, besides other injuries, a simple transverse fracture of the patella. On opening the joint it was seen to be free from blood, though a little did exist between the fragments. The fibrous covering, as well as the aponeurosis of the extensor muscle, were completely torn across. The fragments could be perfectly coapted. On looking closely at the fractured surfaces, the soft parts, from the anterior aspect of the patella, were seen to fold over the fractured extremities, and to have become so intimately adherent to them that it was only after repeated scrapings with the point of a scalpel that the soft parts were elevated. This was especially the case with the upper fragment, whose whole surface, excepting a small part at its inner side, was completely covered. It was plain that osseous union

could not take place so long as that closely adherent layer of soft parts remained between the broken extremities, however close the coaptation might be. The soft parts thus placed between the broken fragments consisted of the fibrous tissue covering the bone and the aponeurosis of the extensor muscle. About a year afterwards, a compound comminuted fracture of the patella came under observation, which was examined with much interest. Here, also, the soft parts adherent to the front of the patella were found to have become displaced and driven over the irregular surfaces of the bone. Some of these osseous irregularities transfixed the soft tissue, which seemed to have been stretched tightly over them. At several places there were long shreds of the aponeurosis from the front of the patella lying loosely over the fragments, and stretching beyond these into the joint. The bursa over the patella had been previously somewhat thickened, and was now torn into several pieces. A fragment of the patella, which lay detached, was covered by a portion of the bursa, which, when elevated, exposed a portion of the aponeurotic and fibrous covering of the patella. It was evident that, under these circumstances, osseous union was impossible, unless after removal of these soft structures. This seemed to me to afford a sufficient explanation of the frequent want of osseous union in transverse fractures of the patella.

It may be supposed that this condition would exist only in direct fractures; but a patella fractured by muscular action will also be liable to a similar disposition of the soft parts. The fibrous and aponeurotic tissues lying in front of the patella are more elastic than the bone. By muscular action the bone snaps and retracts. The fibrous and aponeurotic tissues over it still holding they bridge the interspace between the two fragments. If the retraction continues, the aponeurotic and fibrous tissues become over-stretched, and lose their resiliency. Finally, if the force be great enough, the bridge gives way, and as the patella retracts the soft tissues on the anterior aspect are pushed inwards by atmospheric pressure, and by the bending of the knee as the patient falls, both tending to drive the over-distended fibrous coverings between the fragments. This is further effected by the manner in which the proximal portion of the patella retracts. The position of flexion of the knee most favours fracture of the patella by muscular action. When fracture in this position does take place, the irregular posterior patellar surface causes the upper fragment to tilt, so that the plane of the fractured surface lies more anteriorly than antero-posteriorly. As the patella recedes upwards, the tissues on the anterior aspect of the limb press the fibrous and aponeurotic appendages over the fractured extremity, where they are apt to be fixed to the fragment by the osseous projections.

In longitudinal fractures of the patella coaptation is easily secured, and osseous union is obtained. It may be asked whether the same relation of the soft parts to the fractured extremities would not be as likely to exist in longitudinal fractures as in transverse. But the aponeurotic fibres running longitudinally, their long axes being in the direction of the fracture, it would be unlikely to find them so detached that they would dip between the fractured ends. The want of osseous union in transverse fractures of the olecranon, and possibly some of those of the os calcis, though the latter are much less frequently met with, would be subject to the same explanation. Believing that this was the true explanation of want of osseous union in many cases of transverse fracture of the patella, possibly of all those that have been brought into contact and their position afterwards maintained, it was evidently futile to attempt to get osseous union by the old treatment of splints without first having cleared this material from the ends of the fragments. With this aim in view I determined, in all cases of complete transverse fracture which came under my care, to adopt the course of cutting down on the fragments, lifting the soft tissues from between them, and then bringing them accurately together. I had no opportunity of doing so till 1882, when two simple patellar fractures came under observation within two months of each other. Both of these were cut down upon within forty-eight hours of their admission. In both the same state of matters existed as regards the overlapping and close adhesion of the fibrous and aponeurotic coverings of the patella to its fractured extremities. In both cases these were carefully elevated, and the fractured extremities brought together by sutures. In both, osseous union took place without any untoward event, and the limb was restored to its proper function.

[Dr. Macewen details the following cases:—(1) A case of compound comminuted fracture of the patella; knee-joint freely opened; occurring in a man affected with delirium tremens; recovery—(2) Case of simple transverse fracture of patella; effusion of blood into the joint; removal of fibrous and aponeurotic tissue from between the fragments; suture; osseous union; perfect movement of knee-joint—(3) Case of simple multiple fracture of the patella; fibrous and aponeuritic tissue between the fractured extremities; elevation of these; suture; osseous union; good movement—(4) Case of ununited transverse fracture of the patella of nine months' standing; gap of six inches between the fragments; operation; method of lengthening the muscle; refreshing of fractured surfaces; suture; osseous union; free movement of joint—(5) Case of transverse fracture of the olecranon; aponeuritic tissue between

the fragments; elevation of these and suture; recovery with osseous union and useful limb. He formulates his conclusions thus:—]

1. The chief cause of non-osseous union of the patella in cases of transverse fractures is the interposition of fibrous and aponeurotic structures between the fractured surfaces. 2. If osseous union be desired in transverse fractures of the patella, it is requisite, in the first instance, to elevate all the tissues which lie over the fractured surfaces, and which prevent them from coming into intimate contact. 3. From the ease in which the two fragments, in many instances, may be maintained in position, it is probable that osseous union could be obtained without suturing, provided these soft tissues were first elevated. Practically, however, suturing the patella ought to be adopted, as it is the easiest and surest way of securing accurate apposition and adds no risk to the operation. 4. The operation of elevating the soft structures between the fragments and of suturing the bone ought to be undertaken within the first forty-eight hours from the time of injury. 5. In order to lengthen a muscle, a series of V shaped incisions made into its substance in a transverse row will effect the purpose, while not diminishing its strength as transverse incisions do.—*Lancet, Nov.* 17, 1883, *p.* 847.

33.—UNUNITED FRACTURE OF THE PATELLA TREATED BY SUTURE AND MALGAIGNE'S HOOKS.

By E. WARD, M.A., M.B., and B.C., Cantab., Leeds Infirmary.

[In reporting another case of fracture of the patella under the care of Mr. Wheelhouse, at the Leeds General Infirmary, Mr. Ward appends the following remarks:—]

At the present time, when the discussion of the treatment of fracture of the patella is absorbing so much attention, it may be of interest to recapitulate some of the conclusions drawn from a series of five cases treated by suture in the Leeds General Infirmary, between August, 1881, and June, 1882 (see *Retrospect*, vol. 88, p. 252). The case now reported also illustrates a successful method of combating the purely mechanical difficulty of approximating the widely separated fragments of old cases, a difficulty which is far from uncommon, and which, in one case mentioned by Mr. Turner in the paper read before the Clinical Society, led to the abandonment of the operation. In one of the earlier cases treated here, division of the quadriceps tendon was tried, but it caused embarrasing hemorrhage, and did not contribute towards the approximation of the fragments in any appreciable degree. With regard to general considerations, the main question is, of course, that of ensuring an aseptic wound.

The ordinary precautions about instruments, hands, spray, dressings, &c., are now almost matters of automatic routine; but there is one important condition about which I wish to speak particularly, for I believe it to be a more prolific source of the so-called "failure of the aseptic method" than is any other individual factor. It is the condition of the tissues, especially the skin of the part operated upon. Within a very recent period I have known of antiseptic (?) operations (not operations of urgency) being performed where almost up to the very moment of incision the skin had been an entire stranger to any form of germicide whatever, and in the practice of this hospital it has been conclusively demonstrated that the method described by Mr. Watson Cheyne is, at any rate amongst the lower classes of a large manufacturing town, in many cases insufficient, and always so in such regions as the axilla or about the toes, &c. Moreover, the application of 1 in 20 carbolic lotion to the skin for half an hour has in several cases produced such severe vesication as to necessitate the postponement of the operation. The plan adopted here in all operations except those of immediate urgency, is to rub the skin vigorously for a short time with spirit of turpentine, which appears to be the most effective solvent of the fatty and sebaceous accumulations about the hair-follicles and gland ducts. The part is then wrapped for twenty-four hours at least in lint soaked in a 2 per cent. solution of carbolic acid. This is renewed several times and the skin shampooed in the intervals so as to remove all the dead epithelium. In a series of more than 100 osteotomies for deformity performed during the last two years, the few cases of suppuration have been generally associated with the insufficiency of this precaution. In operations for injury, strangulated hernia, &c., dependence is placed almost entirely upon the turpentine as a solvent and antiseptic. It is a striking fact that the proportion of suppurations in primary amputations as compared with those for disease (except for gangrene or other antecedent putrefactive conditions) is about two to one. It is also worthy of remark that these suppurations appear as a rule to be conditioned by and limited to a micrococcus infection, and do not develop the putrescent features of open septic wounds. The vertical incision is the simplest and best in recent cases, but when greater holding power is required, it is much more convenient to make it transversely. The great advantages of Malgaigne's hooks in procuring and, under certain circumstances, maintaining apposition was seen in the present case. In the first and second cases, in August and October, 1881, the wire twists were cut short, hammered down, and left *in situ*, and in both cases, when seen almost a year afterwards, the sutures had not caused any irritation whatever. In the old-

standing cases one suture was found to be insufficient, and in the first and fourth cases three were used. In the three later cases the sutures were removed, and there does not appear to be any special advantage in leaving them *in situ*, for any force sufficient to refracture a firmly united patella would almost certainly either break the wires or tear them out. Of the three patients who were kept in view longest, the only one who could not bear to kneel was the one in whom the sutures had been left. Drainage was entirely dispensed with in two cases, for reasons which were discussed when the cases were published, and which still indicate a similar procedure in similar conditions. Salicylic silk was used in all the dressings, and in the appended case it was impregnated with iodoform powder by means of an ordinary dredger. Passive motion was only practised in one case for a few days; in all the others the natural movements of the joint were quite sufficient to restore the normal range of flexion.—*Lancet*, *Dec.* 15, 1883, *p.* 1042.

34.—ON EXCISION OF THE SHOULDER-JOINT.

By WILLIAM STOKES, F.R.C.S.I., Professor of Surgery in the Royal College of Surgeons, Ireland.

The remarkable change for the better in the results now obtained is undoubtedly due to the abandonment of flap-methods of operating, to the adoption of the Ollier or Langenbeck-Ollier line of incision, to antisepticism, promoting thereby rapidity of union; and lastly, and perhaps as regards the ultimate result most important of all, to the early commencement of passive movements, exercises of the arm, and shampooing, which so materially aid in preventing the formation of fresh internal adhesions, and promoting restoration of muscular power. If the adoption of judiciously directed gymnastic exercises and shampooing be had recourse to at an early date after the operation, an all-important factor in the after-treatment of such cases, the good results above indicated, and which should be hoped for in all instances, can reasonably be expected, and that not only in early but in adult periods of life. I can best emphasise these statements by relating the principal facts connected with one of three cases of interest in which resection of the shoulder-joint was indicated.

J. McK., a strongly built man, aged 40, a farmer, first came under observation in the Richmond Hospital in June, 1879. He stated that, two years previously, he noticed for the first time a little stiffness and pain about the left shoulder-joint. This appeared without any assignable cause, and slowly but steadily increased. On making any sudden movement of the joint, a stinging pain suddenly caught him, which commenced

in the vicinity of the acromion process, shot down along the outer side of the arm, and stopped as suddenly as the cessation of the motion which gave rise to it. This stinging pain always travelled along the whole length of the humerus, and invariably stopped short at the elbow. Movements of a rotatory nature were those most surely followed by it, and the combination of muscular actions called into play in—to use his own words—"putting on his coat in the mornin'," was found to act as a special irritant. Still, the pain was not very acute, and did not interfere seriously with his occupation as a labourer on his farm. At the same time, there was some tenderness on deep pressure, and he found he could not lie on that side—the left—without very considerable discomfort being experienced from a dull aching pain in the shoulder-joint and the upper third of the arm. There was no enlargement, nor superficial redness. The appetite continued good, and all the various excretory functions were duly performed. About five weeks before his admission into hospital, he had been exposed to severe cold and wet for a whole day. He was engaged in the formation of a drain in a "stiff gravelly soil;" and, as the nature of his task necessitated his being stripped to his shirt-sleeves, the affected limb was very much exposed to the cold and rain of an exceptionally severe day. The result was that he had a severe shivering fit on that evening after returning to his home; and after a night of disturbed and unrefreshing sleep, he found himself "sick and hot" on the following day. The ailing shoulder now felt very stiff; and, on examining the part more particularly, he found that it was very much swollen, the tumefaction engaging, also, the upper half of the arm. Still, there was no superficial redness, and there was no acute pain. The original stinging pain was rather diminished than increased. The sensation was one rather of fulness and stiffness. The swelling so formed never disappeared; on the contrary, it increased very slowly indeed, but surely, up to the date of his presenting himself at the Richmond Hospital.

On examination at the time of admission, there was obviously very considerable thickening of the upper half of the shaft of the humerus. The enlargement evidently engaged the head of the bone as well, and a direct result was the interference with the freedom of the movements of the joint, and a grating sensation was conveyed to the hand when the elbow was removed to any considerable distance from the side of the body.

The case was treated mainly by fixation of the limb by means of leather and poroplastic splints and mercury; the latter being administered by means of inunction. After some weeks a marked improvement was observed, and the patient returned home; but, on Feb. 11th, 1880, he was readmitted into hospi-

tal, when I found that two sinuses had formed in the neighbourhood of the shoulder-joint; one on the anterior, and a second on the posterior, aspect of the joint below the spine of the scapula. To determine more accurately the amount and situation of the disease, I made an exploratory incision, posterior to the joint, over the spine, down to the bone, and along the track of the sinus, but failed to find any denuded bone. On this wound being healed, I then (Feb. 25th) exposed the head of the bone by a long anterior incision (Langenbeck-Ollier), and found the head of the bone partly absorbed, and completely denuded of cartilage. This was then removed by a somewhat oblique incision carried from above downwards and inwards. The appearance of the bone through the line of section was satisfactory. No disease in the glenoid cavity was observable. A conical antiseptic pad being placed in the axilla, a drainage-tube was inserted in the wound, and the usual Listerian antiseptic dressings applied. No splints, or any mechanical appliance other than the antiseptic gauze bandages, were applied. Primary union took place. The drainage-tube was removed on the third day, and the process of union progressed steadily, without suppuration, but with a certain amount of serous discharge. On March 5th the wound was closed, and the gymnastic exercises commenced. These consisted in flexion and rotation, circumduction, abduction, and adduction of the arm, combined with daily shampooing of the muscles of the shoulder. On April 24th, he returned home, all the portions of the joint being, to a great extent, restored; and a year subsequently I had a letter from Dr. Faussett, who forwarded the case to me, to the effect that there was excellent restoration of the movements of the arm, and that the patient was able even to use his spade in digging the fields, and other agricultural employments.

The method of operating which in all cases I have adopted is a modification of the Ollier-Langenbeck periosteo-capsular method. The incision was in all instances commenced a few lines external to the tip of the coracoid process, and carried downwards and slightly outwards, avoiding the cephalic vein, for a distance of about four inches, and a little external to the inner border of the deltoid muscle. By this, there is avoidance of the posterior circumflex artery and nerve, and there is the minimum amount of interference with the deltoid. The functions, therefore, of this muscle are by this procedure better preserved than by any other of the suggested operations; and there is great facility attending the division of the capsular muscles of the shoulder, notably the subscapularis.

In reference to the osseous section, the importance of not removing more of the bone than is absolutely necessary should

be borne in mind. Mr. Holmes is undoubtedly right in holding that the cause of the usual inability in these cases, after operation, to elevate the arm above a horizontal line, depends more on the absence of a point of support for the humerus than on any loss of muscular power. The chances of getting that power will naturally be increased, the smaller the amount of bone removed. One of my cases afforded an illustration of the possibility of obtaining the power of elevation of the arm beyond the horizontal line—a rarely obtained result, I admit; but it can only be hoped for in those cases where the disease is of sufficiently small extent not to necessitate the removal of more than a very limited amount of bone.

In connection with preservation of periosteum in this operation, I confess I am disposed to modify very materially the views I at one time held as regards its surgical value in resection of the shoulder and other joints. In the elbow, I have unquestionably seen as good results obtained without periosteal preservation as with it. In the shoulder, I would only be disposed to adopt it in traumatic cases, such as the remarkable one recorded by Sir W. MacCormac, in which he excised the shoulder and elbow joints on the same side and in the same individual, on account of a severe gunshot injury. In this case, there were three important factors which indicated preservation of the membrane—the youth of the patient, a previously healthy condition of the parts, and, lastly, the fact that a portion of the shaft of the humerus had, owing to extensive comminution, to be removed. In pathological resections, however, such as I have drawn attention to to-day, it is very questionable if a reformation of the portion of bone removed be necessary or desirable; as it sometimes happens—notably in resections of the elbow—that the newly formed bone is irregular in form, and interferes with the motions of the joints.

These somewhat depreciatory remarks in reference to preservation of periosteum in resection of joints do not, of course, apply to resection of bones in their continuity, in which undoubtedly the advantages of the practice are signal and distinct. Another important matter is the advisability or otherwise of using splints in the after-treatment of these cases. In resection of the shoulder, as well as of the elbow, I think them as unnecessary as they are indispensable in the hip and knee. Objections have been urged to their abandonment in the two former procedures, on the ground that, by so doing, the surgical axiom that repose is necessary to repair is violated, and that a "perpetual motion" style of practice is substituted. I am inclined to think, however, that this alleged "perpetual motion"—doubtless a very exaggerated term—instead of being a disadvantage, is a desirable feature in the after-treatment alike of

resection of the shoulder and of the elbow-joint; and I am strengthened in so thinking from knowing that the late Prof. Syme, a surgeon far in advance of his time, and whose sagacity was only equalled by his foresight, held a decided opinion as to the desirability of not rigidly fixing the limb to splints for any lengthened time after these operations. The "perpetual motion" bogus, therefore, need not be much dreaded; for, if proper antiseptic precautions be adopted, the absence of fixation does not interfere with that rapidity of union which is so important a factor in facilitating the adoption, at an early date after the operation, of those exercises all-important in enabling the patient to get good subsequent movements and use of the limb.

This rapidity of union can undoubtedly be best obtained by a rigid adherence to Listerian antiseptic practice, both during and subsequent to the operation. I can quite endorse M. Ollier's statement, that Lister's method not alone prevents inflammation without arresting the physiological processes of repair, but "accelerates the healing of wounds, in its enabling the surgeon to arrest, after the operation, those changes in muscular and nervous tissue which are the result of prolonged suppuration associated with prolonged immobility of the limb."

Lastly, I would mention one or two encouraging statistical facts connected with both traumatic and pathological resections of the shoulder. As regards the former group, we learn, from the researches of Sir W. MacCormac and Prof. Billroth, that the rate of mortality is far smaller proportionately than the so-called conservative treatment, namely, 35 per cent., as compared with 52 per cent. These statistical facts do not, it is true, coincide with what was observed during the American war, when the mortality after excision was 36·6 per cent., against 27·5 per cent. after "expectancy." "If," however, as Dr. Edmund Andrews has observed "we reflect that the cases selected for this plan were the least seriously injured, the apparent statistical advantage is more than accounted for by the mildness of the cases. He would be a rash man who would be so infected with conservatism, as to leave to unaided nature a shoulder-joint filled with bony gravel from the comminution of the humerus." Another equally important and interesting fact is that, even in the pre-antiseptic period, the statistics of pathological resections of the shoulder, as given by Heyfelder, Hodges and others, record a mortality of only about 17 per cent. The next statistical record made of such resections, whether performed for traumatic or pathological, suppurative or non-suppurative lesions, will doubtless show a vast diminution in this percentage.

Conclusions.—1. The operation should be performed by the

Ollier-Langenbeck method, avoiding, however, in pathological resections periosteo-capsular preservation.

2. The excision of bone should be as limited in amount as is compatible with the removal of disease.

3. Preservation of the periosteum is only indicated in traumatic resections, where there is much involvement of the shaft of the humerus.

4. The use of splints is not indicated in the after-treatment of resection of the shoulder-joint.

5. Rapidity of union is strongly indicated after this operation, and can best be obtained by a rigid adherence to Listerian antiseptic practice.

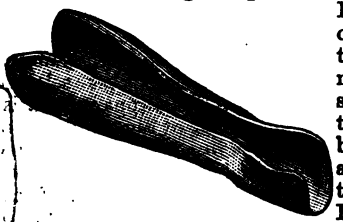
6. Passive movements, gymnastic exercises, and massage, should be commenced as soon as possible after the operation.

7. The statistics of the operation, whether done for traumatic or pathological, suppurative or non-suppurative lesions, are eminently satisfactory and encouraging. — *British Medical Journal, Nov.* 10, 1883, *p.* 905.

35.—SPLINT FOR FRACTURES OF THE FOREARM.

By HENRY FISHER, M.D., Chelsea.

After a more matured experience in the use of poroplastic felt as an appliance in surgery, I beg to introduce a splint to the notice of surgeons, for which I claim many advantages over the ordinary method of treating fractures or injuries of the forearm requiring splints. Cocking's poroplastic felt as a splint has many advantages, I think, over every other material—such as wood, leather, or gutta-percha, commonly in use. (*See woodcut.*)



It has the strength of wood; can be moulded to shape easier than leather, as well as being much cheaper; and must be superior to gutta-percha, owing to its porosity and lightness, besides retaining its shape at a temperature of inflammation, which the latter will not. Before introducing this splint, I wish to explain to surgeons, especially out of London, and those who have never taken the trouble of learning what poroplastic felt is, of what the material is composed, so that they can judge for themselves of its adaptability as a splint for surgical use. Poroplastic felt is nothing more than fine felt, from one-eighth of an inch in thickness, according to requirements, saturated with a spirituous solution of gum resin, combined with shellac as the principal ingredient, dried, and so prepared

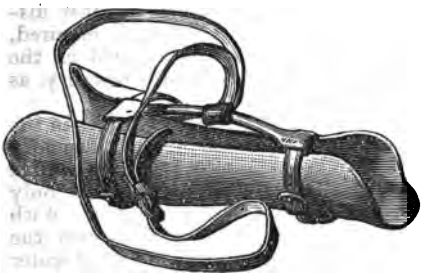
as to guarantee its remaining porous. Mr. Cocking being the patentee of the process, there is no necessity for me to dwell on its preparation. It is quite as strong as wood of the same thickness, readily moulds to any shape at a heat of 180°, and retains its shape when allowed to set, even at blood heat, if held in the position it is required to assume for two or three minutes.

The advantages I claim for this splint, and which I will endeavour to explain, are: 1st, the facility with which a fracture can be treated—for shortness I will say "put up;" 2nd, doing away with all padding, which is necessary more or less with ordinary splints; 3rd, a perfect guarantee against displacement by shortening or otherwise; 4th, room, if required, for swelling, by loosening the ties without removal of the splint; 5th, no necessity for an arm-sling towards recovery, as it answers that purpose at the same time.

In ordinary cases of fractured forearm, apply a roller in the usual way, and place the splint on by forcing it sufficiently open to allow the arm to fall into its position, then a couple of ties, one above the wrist and the other near the elbow, only tight enough to be borne with comfort to the patient. With regard to Colles's fracture, when it is necessary to depress the hand and retain it so, the splint may be immersed in hot water as far as the wrist, then bent to suit the shape required, where it will fix the hand by an additional tie across it. The dispensing with use of pads in case of heat and swelling must be of great service. There is no fear of shortening, which is prevented by the wrist being so much smaller than the hand, it cannot recede by muscular action; *vice versâ*, the muscles of the forearm, being fixed in conical shape, cannot contract towards the wrist. The splint is so manufactured as to leave about half an inch along its back only partially hardened, so that it acts as a hinge in opening for application, but at the same time sufficiently stiff to act as a spring to keep it in its moulded position, and not too strong to give enough in case of swelling, so that the patient can at any time relieve pain himself by loosening the ties, without any fear of displacement of the limb. As will be seen in the diagram, it partly covers the radius, thereby preventing any deformity in that quarter; but should it so happen not to fit accurately at any

particular part, it may be softened before the fire, or dipped in hot water, then moulded exactly; even if the surgeon should not have the splint the length suited to the arm he can adapt a larger size in the same manner, the arm having been previously bandaged.

It may be contended that a piece of prepared felt can be moulded in the same manner to any arm, as required; but I say it is quite impossible to do so, owing to the amount of pressure it would require on the soft parts, were the heat itself not too much for the skin to bear. I may mention that before I introduced this splint, which would be useless were surgeons not able to obtain it, I had a promise from Mr. Cocking, the patentee, that he would have it manufactured in six different sizes, and supplied through his agents, both in this country and abroad, in two qualities, to suit both private and hospital practice, the sizes ranging in male and female from ten years of age up to the largest sized man's arm, and from which plaster casts have been obtained, afterwards cast in iron in order to secure perfect shapes for moulding the splints on. There being only half an inch between each in length must cause very little difficulty in selecting a size to suit any particular case which the surgeon may meet with in ordinary practice.



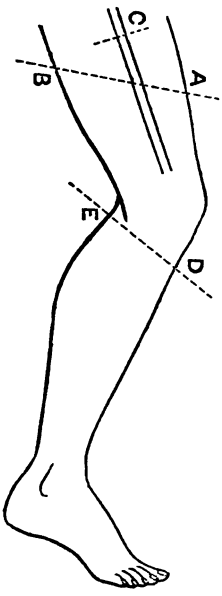
This splint is also mounted for an arm-sling, on the principle shown in the above woodcut, having the advantage that the hand can be raised or lowered at the will of the patient, leaving the fingers quite free for use when required.—*Lancet, Oct.* 27, 1883, *p.* 722.

36.—AMPUTATION BY OBLIQUE CIRCULAR INCISION.

By James Hardie, M.D.Ed., F.R.C.S.Eng., Surgeon to the Manchester Royal Infirmary, &c.

Bearing in mind the favour which the circular operation generally receives at the hands of operators, on account of the ease and rapidity with which it may be executed, it appeared to me that it might be modified. I have, therefore, been accustomed to hold the knife obliquely to the axis of the limb, in making the sweep around it, instead of transversely, as in the

ordinary operation. To take the middle of the thigh as an example, I place the heel of the knife at A, draw it round the limb obliquely, upwards and backwards, at an angle of about 55° to its axis, to B, where the direction changes, as it passes round the posterior aspect, to a direction obliquely downwards and forwards back again to A. Both at A and B, the line of incision is slightly rounded, so that A is convex and B concave. This incision goes at once down to the muscular aponeurosis; although it is convenient, for the subsequent insertion of the stitches, to have the skin free from fat midway between the upper and lower limits of the incision, on both the outer and inner side of the limb, as the flap has here to be folded on itself. The skin and its attached fat is next dissected back for a couple of inches at A, and taken in hand by an assistant, who pulls it upwards, so as to enable the surgeon similarly to separate it to a less extent all round the limb. This being done, the knife is then sunk obliquely into the anterior muscular mass, as was done by Alanson, until it reaches the bone; and the whole being well retracted, the remaining mass of muscles is totally divided in the ordinary manner by two principal strokes of the knife, the direction of which is still slightly oblique towards B. The bone being cleared, it is sawn at C, which is about an inch or an inch and a half above B.



As a result of this method of operating, the anterior portion of the soft parts falls well over the face of the stump and end of the bone, the convex anterior flap fitting nicely into the concave posterior, and, when healing is completed, the scar is entirely behind the bone, and in no danger of pressure. All the advantages of the method by long anterior and short posterior flaps are also preserved, and I believe it will be found that greater facility and expedition in operating are secured.

[A patient was exhibited in whom the operation was performed at the junction of the middle and lower thirds two years previously, and who was able to walk perfectly with the weight of his body resting principally on the end of the femur.]

Amputation through the knee-joint, with preservation of the

patella by this method, I find to be a most excellent operation; excellent in the ease with which it is performed, and in the stump which results. In this situation, owing to the distance to which the integuments of the ham retract after their division, it is advisable to draw the incision less obliquely than in the thigh, and my rule is to begin an inch and half below the tubercle of the tibia, and to draw the knife round to a point about an inch below the cutaneous fold of the ham, D.E. The skin and subcutaneous cellular tissue having been dissected up until the lower border of the patella is visible, an operation which is facilitated by flexing the knee, the ligamentum patellæ is divided, and the head of the tibia, with the semilunar cartilages, then separated by division of the other ligamentous structures. The assistant having then carefully drawn the posterior border of the incision out of harm's way, the whole of the structures behind the joint are next divided by a single stroke of the knife, from the surface inwards. With the exception of Syme's ankle-joint amputation, I know of no operation which gives a better stump than this amputation through the knee; and I may remark, parenthetically, that I believe we should consult the prospects of recovery, and the future comfort of our patients, were we oftener to select amputation in this situation rather than in the upper third of the leg. [Two patients were exhibited showing this amputation.]

In the leg, the incision may be drawn from before backwards and upwards, as in the thigh, special care being taken to slope the knife well upwards when dividing the sural muscles. Occasionally, on account of the tendency which the skin covering the inner surface of the tibia has to slough, I have taken the covering from the outside, retaining as much as possible of the muscular tissue attached to the fibula, and dividing the bones almost at the level of the incision on the inner aspect. The former method gives the better stump should no accident befall it, but the liability to sloughing is undoubted.

Although it is to amputation in the lower limb that I look upon this operation as specially applicable, yet I have also had recourse to it in the upper. Here, probably, the covering is best taken from the posterior aspect; and, in one case of amputation through the elbow-joint, I obtained an exceptionally good result in this manner.

I have practised this operation now for over ten years, under the name of "oblique circular" amputation, as a term best describing its main feature. I am bound to confess, however, what I have not long since discovered, that an operation in all essentials the same has for long been described by French writers, as invented by Soupart of Liège. Though I cannot, therefore, introduce it to you as a new operation, yet I can

cordially recommend it as an old one. I should have been glad, had I been able, to bring before you a greater number of persons on whom I have practised it; but, although I have only succeeded in tracing three whom I could bring to this meeting, I can frankly state that their stumps are not better than those which may generally be obtained.—*British Medical Journal, Jan.* 19, 1884, *p.* 98.

87.—ON INCISION IN THE TREATMENT OF ARTHRITIS.

By F. Richardson Cross, M.B., Surgeon to the Royal Infirmary, Bristol.

For about twenty-five years, joint-disease has been met by amputation, excision, incision, and gouging or chemical treatment of the affected parts; but the modes last mentioned have never become very popular. Excision and amputation have been much more frequently adopted than any more conservative operation. Incision was still dreaded, even in acute suppuration, and rarely used for the chronic abscess of white swelling. As in the case of psoas abscess, the admission of air was followed by rapid failure in the health of the patient; and means were rather used to prevent the discharge of the matter, than to induce it.

The risk to the patient from surgical fever was greater after a partial operation, where many of the tissues were lacerated, and where much material, lowered in vitality, if not actually diseased, was left in a cavity imperfectly drained, than after excision, where cleanly cut surfaces were put in good position, and all highly putrescible remnants of the former disease were taken away. Hence excision was more often resorted to than incision and gouging.—Again, excision usually required a longer period for healing than amputation done for the same circumstances, and the risk to the patient was undoubtedly prolonged; and this particularly as regards operations for diseased knee, wrist, and ankle, in which many surgeons, at the present, would recommend amputation rather than any more conservative operation.

At length Prof. Lister, applying Pasteur's views to the living tissues, built up his theory of septic fermentation; and, by his system of antiseptic treatment from the moment of the infliction of the wound, has virtually abolished the risks which patients formerly ran from surgical fever after the performance of any operation. I consider that clinical experience abundantly supports Prof. Lister's views; and that we may do any kind of operation upon a joint without considering the risk of surgical blood-poisoning. Under some circumstances, where surgeons formerly did right not to interfere, as in some cases

of chronic abscess, we are now wrong in withholding antiseptic operation; and excision of joints is certainly put in a much stronger position as compared with amputation; while the relief of tension by puncture, in acute inflammation of bones or joints, is absolutely demanded.

It is well worth while for a patient to wait some extra time to save a joint; but, in hospital practice, the time for waiting must come to an end, and I fear my statistics tend to show the futility of hoping, after *pronounced disease of the joint* has set in, to get a successful termination short of excision.—In the elbow-joint, any operation short of excision results in ankylosis, for which excision will be eventually required. In this joint, if I find it necessary to operate at all, and the mischief be not distinctly extra-articular, I shall, in future, excise at once.—In the hip and shoulder, amputation is rarely admissible, and excision gives good results. In the hip, probably, my cases show more unfavourably than they should do for waiting or partial operation. I think disease of the astragalus will usually require amputation of the ankle.—For injury, and in healthy subjects, partial operations would, of course, be comparatively favourable. In the knee-joint only, partial operations for disease seem to be followed by a good result.

For the last five years, I have treated my joint-cases requiring an operation by methods short of excision and amputation, and the same practice has been much in vogue among my colleagues; but, in the cases of *thorough disease*, the results have been very disappointing.—In private practice, a diseased joint is early diagnosed, at once rested, and continuously watched, and cure, perhaps with ankylosis, is almost certain.—Poor patients, if sent sufficiently early into hospital, are improved by rest, but are generally discharged before they are well, and return later, with the disease far gone, with abscess or discharging sinuses. These cases almost all require an operation for their relief. I have notes of 117 cases; 60 under my own care, a few early ones cured by rest; and 57 cases of my colleagues; in all of which some operation had been done. Half in each set were diseases of the knee-joint.

A bloodless operation under anæsthesia allows thorough exploration of a joint, and the removal of such portions of it as may alone seem implicated in the disease.—It seems specially important not to allow an abscess connected with granulo-fungous disease of a joint to burst through the skin, and thus to become septic, together with the fungous granulation-tissue already tending to suppurate. The aspirator might be used to prevent this; but I prefer to incise any abscess, and fully explore it with the finger, in search for caries, sequestra, or any form of diseased joint. All the cases

in which *no definite arthritis was discovered, though some appeared to be connected with diseased joint*, seem to have been cured by this method of incision; but, where there was *definite joint-disease*—excepting at the knee—no treatment short of excision or amputation seemed of benefit. All the cases of purulent synovitis fully recovered with antiseptic incision and drainage; among them, one of a knee suppurating in the sixth week of acute pyæmia, and one of purulent arthritis, after scarlet fever, in a knee and both elbows, in one of which epiphyses could be felt loose. Subcutaneous puncture relieved pain, and probably also opened a nidus of inflammation early, and away from the joint.

Shoulder-joint.—There were 4 cases, all with granulo-fungous disease and abscess. In three, the main disease lay in the head of the humerus, and the abscess pointed anteriorly. One of these underwent primary excision; the other two required excision after incision and gouging had been tried. The fourth case recovered after incision; the disease was on the posterior edge of the glenoid cavity, and the abscess pointed behind. This joint, however, became ankylosed.

Elbow-joint.—There were 16 cases of excision. Two were cases of abscess contiguous to, but probably not in, the joint; they recovered completely after incision. In a case of suppuration in a knee and both elbows, one containing loose epiphyses, following scarlet fever in a child two years old, movable joints were left after incision. Eleven cases of granulo-fungous disease were treated by incision, gouging, and scraping of various kinds suitable for each; all resulted in ankylosis. In a case of old fracture of the coronoid process, with dislocation backwards, I dissected out the coronoid process through an incision on the inside of the elbow. There was no distinct ankylosis; but I got no further movement during the operation. Healing followed by first intention. Later, I excised the lower end of the humerus freely, and the olecranon, leaving the radio-ulnar joint, with a good result. It seems best at the elbow-joint, except in cases of uncomplicated suppuration or necrosis, to excise at once.

Wrist.—In the wrist, if rest and extension do not effect a cure, excision or amputation seem demanded. Of 6 cases four were amputated after treatment by incision had failed. In two cases, I removed with success the lower end of the radius and ulna for disease in the radius, leaving the carpus, with a good result. Excision of the wrist seems not to be a dangerous operation, and should probably usually be tried before amputation is resorted to.

Tarsus.—Of 12 cases of diseased tarsus, one, affecting the cuboid bone only, improved under gouging. Two cases of

abscess, probably intra-articular, at the malleoli, recovered by incision. In nine cases, the astragalus was diseased. Incision cured one where abscess had pointed below the head of the bone. Eight required amputation after partial operations had failed. Six of these showed disease of the ankle proper; two of the posterior astragalo-calcaneal joint. Some cases of diseased os calcis have done well by scraping out caries or sequestra. But in one, I got no result till the whole bone was excised.

Hip-joint.—There were 21 cases. Four out of fifteen under my own care were cured by rest. Eleven had abscess or sinus; these were incised or scraped. Only two recovered under this plan; and, in these, the abscess was probably extra-articular. Of six that came to operation under my colleagues, one only was apparently improved by boring the head of the femur through the trochanter. Three cases of abscess came to excision. Partial operation did no good in two other cases (one with abscess, one with sinus). These cases seem to show the futility of any operation short of excision for morbus coxæ. If abscess form, it must not be let open itself, to become septic. If examination with the finger after incision in the abscess-sac demonstrate *distinct disease in the joint*, I should now agree with Mr. Croft to excise at once. If nothing but abscess be detected, the patient will probably recover. If the mischief be only slight a further limited period of rest should be tried. The comparative results of rest and early excision, as published by the Clinical Society, gave the following figures. Of 260 cases of suppurating hip-joint treated without excision, 33 per cent. died. Of Mr. Croft's cases of excision, 40 per cent. died. Of Sayre's 71 cases of excision, 73 per cent. reached a successful termination. If the patient's health be failing, I should hope nothing from partial operation, but should excise at once. Synovial disease gives better prognosis, than where caries of bone exists. Necrosis of the head of the femur requires excision.

Knee.—In diseases of the knee, I prefer only to take the 28 cases of which I have notes under my own care. Here partial operation seems indicated, especially in chronic cases and in adults. Four were cases of *synovitis*, all in adults, and due to injury. One case resisted all kinds of treatment, among them aspiration and elastic bandage, for nearly a year, when the patient completely recovered under the use of a drachm and a half of iodide of potassium daily. I had treated him for syphilis some months before the accident, and smaller doses of iodide of potassium had completely failed. Another got a stiff knee, but was cured by forcible movement. Three cases of *purulent arthritis* recovered, with movable joints, under incision and

drainage. Two other cases of *acute suppurative arthritis, complicated with other disease*, did well under incision. A child was suffering from white swelling and psoas abscess. A man had suffered from rheumatics in the knee for three years; suddenly, he was unable to stand. Two days afterwards he had much fever, and on the sixth day I opened the joint, which was full of pus. On the inner side, both of the tibia and of the femur, there was a raised cartilaginous ridge. The anterior part of this on the femur was very prominent, and I removed it with a gouge. It proved to be cartilage with a bony centre, and, *broken* off, would have made a loose body nearly as large as a bean. In two months he could walk about, the leg still stiff and painful. There was another interesting case. A young man struck his knee. He had all the symptoms and signs of pus in the knee. The patella was floating. Aspiration emptied a sac of pus on the outside of the joint. Incision and examination with the finger showed one on the inside to be extra-articular; much sympathetic synovitis was present.

The other 18 cases were of *granulo-fungous disease*. Of two I have no notes as to position. In sixteen the main disease was distinctly localised; one mainly in the synovial membrane above the patella; five in the head of the tibia; five in the joint inside the patella, and between the tibia and femur; three in the inner condyle; and two outside the patella. The case where the disease was mainly in the synovial membrane was fired; a month later he had several small abscesses threatening to burst. I incised and scraped them all with a good result. Three cases were amputated. One was very instructive. A number of sinuses, connected with a knee ankylosed at an angle, when laid open and examined, led nowhere definitely. In sawing the femur, I opened an abscess in the shaft of this bone, and another was found in the head of the tibia. Excision would not have dealt with the upper of these, but, if diagnosed, it might have been trephined. The other two were sent to be amputated, and the patients wished it done. In two cases I did excision for ankylosis in bad position. Twelve knees were incised, some also gouged and drained. One man had disease of five years' standing, and came for excision. I treated an abscess on the inner side of the joint, and cured him of pain and lameness. His knee was already ankylosed. One patient, aged sixteen, had a stiff swollen knee of five months' duration, with pain and tenderness over the patella. Incision and drain into the internal condyle, where there was an abscess, cured him in a month. He had experienced pain on the inner side of the knee for three years. In a young man, I mistook slight chronic white swelling for rheumatic ankylosis, and in bending the knee broke the femur. Five months afterwards he complained of pain on the

inner side of the patella deep in the joint. I cut into a small abscess that lay here. Shortly afterwards, by his own wish, I simply cut into the outside of his joint, and rid him of neuralgia, which, I suppose, was due to some small local tension.

I lately showed at the Bath and Bristol Branch a boy with almost perfect movement of the knee, and with no definite anatomical abnormity, from whom, in 1879, I had removed the greater part of the inner condyle, the inner tuberosity, and the inner fibro-cartilage, for strumous disease of this side of his joint.—*British Medical Journal, Nov.* 10, 1883, *p.* 910.

38.—CASES OF DEFORMITY OF LOWER LIMB TREATED BY SIMPLE FRACTURE OF THE FEMUR.

By RUSHTON PARKER, M.B., B.S., F.R.C.S., Assistant-Surgeon to the Royal Infirmary, Liverpool.

Among the various forms and degrees of knock-knee, bandy-leg, and other deformities of the lower limbs, there is some scope for selection in the method of treatment. In childhood much can be done with the aid of splint and bandages alone, without operative interference at all, to favour the resumption of proper line by natural growth, as has been well said by Mr. E. Owen in the British Medical Journal of Feb. 21, 1880. The force that distorts young limbs is apparently not great when the bones are abnormally soft, or the ligaments weak or overstrained. Similarly, the force required to train such limbs back to the proper line is frequently but slight when diligently and carefully employed. But there are cases in which, even at a very early age, the bones have become too hard, and the curves have become too abrupt, to permit of successful mechanical training in aid of natural growth. Simple fracture of a bone, whether tibia or femur, is, in certain instances, effectual in permitting replacement of the joints of the limb in suitable line one with another. The mere shape of the bones is often of no moment in determining the efficient strength of a limb; and, as a general rule, the present writer is now more particular about the relative position of the joints in one and the same straight line than about the exact shape of the bones. The latter may be obviously deformed without interfering with the mechanical efficiency of the limb, provided the joints be in line; whereas, as some of the above cases show, but slight deformity of bone may lead to conspicuous weakness and deformity of limb. These cases illustrate a single item in the wide domain of treatment, and do not interfere with the useful fact that antiseptic osteotomy effects the correction of similar deformities in cases to which simple fracture or mechanical training are not applicable.

Case 1.—*Incurvation of Right Thigh, laming the Patient;—Fracture of the Femur, permitting the Hip, Knee, and Ankle to be in the same Straight Line—Perfect Cure after Union.*—Sarah A. E., aged 14½ years, visited the Royal Infirmary in May, 1878, to show the completion of her cure, which was effected, however, in the Stanley Hospital, where she had been admitted early in October, 1877. She was fairly stout generally, being also well-built and of moderate size as to her arms and trunk, but of short stature owing to the stunted length of the lower limbs. The tibiæ were flattened laterally, and bent with the convexity forwards—the right rather more so than the left. The bones were quite strong, and the left limb altogether was quite useful, but the patient complained of weakness in the right knee. This complaint was at first but little heeded by Mr. Parker, as no obvious reason for it was recognised on examination in the standing posture at her earlier visits. After repeated and persistent complaint, and the assurance of her mother that the girl's disablement was authentic, her right limb was examined more closely as she lay down. On placing the upper part of the thigh in a position of normal symmetry, it was found that the leg lay across and in front of its fellow, instead of parallel with it. This was found to be due to a curve in the femur rather below the middle, the convexity being outwards, and to a rotation of the lower end of the bone, causing the back of the condyles to look obliquely inwards. The effect of this was that one of the three joints was always out of the line of the other two; and although the bones, joints, and muscles were all strong enough, the attempt to use the limb as a prop to the body could only be made at a strain upon the knee-joint (of which she most complained), that was now comprehensible enough. She was put up in a Thomas's knee-splint, the limb being fully extended with the aid of stirrup-strapping to the leg, and lateral bandaging being brought to bear, by pressure and counter-pressure, on the knee and femur, in the hope that the bone might be induced to grow into the desired position. But it soon became evident that the time for any such process was now past in this case, and that the bones were far too short and too strong to be influenced in that way. After a month, therefore, further trial was abandoned, and fracture of the femur determined on if practicable. This was done under ether on Nov. 16, 1877. The knee-joint was first fixed straight in a series of padded splints of sheet-iron, enveloping the upper half of the leg and the lower third of the thigh, and tightly bandaged on so that that part of the limb below the femoral curve became stiff enough to serve as a suitable lever. The thigh was laid on its outer side, the upper part being held forcibly down on the table, the convexity of the curve lying on

the edge of the table, and the rest of the limb projecting beyond the edge, being held by the operator. It was then found not difficult with such powerful leverage to break the thigh at the spot desired. When the crack occurred, after a short effort, the limb was easily straightened until all the three joints were in the same straight line, without entirely separating the fragments on the previously convex side. The splints around the knee being removed, Thomas's knee splint was then replaced, and four sheet-iron splints, padded with boiler-felt, surrounding the femur, put on in addition, for due fixation of the fracture. One of these splints, a little longer than the others, supported the back of the thigh and knee-joint, swung between the bars of the Thomas's splint.

Three days later, the thigh was found free from pain and tenderness, the uppermost short splints having been lifted off for inspection and then replaced. A little fulness and elasticity also were perceivedin the knee-joint from effusion of fluid. The patient was permitted to sit out on a chair. After five days (Nov. 21) the effusion into the joint, having increased, was drawn off by aspiration through a needle the size of a No. 2 catheter. The fluid was two ounces of bright liquid blood or bloody serum. At the end of a week she was up, and occasionally moving about the ward, the apparatus being a "walking splint," and permitting this. At the end of a fortnight she went home—wearing the splints, of course. On Dec. 19, five weeks after fracture, she called and had the sheet-iron splints removed, the walking knee-splint, however, being retained. On January 9, 1878, after eight weeks, she could bear a good part of her weight on the limb without the splint, which she then wore part of each day only for rest. At the end of May, 1878, she called to show herself. Having to come about three miles, she wore the splint for that occasion only, but she had discontinued its general use for some months previously. The limb was in every respect useful, and has continued so ever since, the three joints being suitably in line, though the bones are, as they have all along been, deformed by rickety curves. These last, however, are not a source of mechanical inconvenience, and therefore require no interference.

Remarks. — It may appear astonishing that this patient should have been allowed to get up a week after fracture of the femur. But the fracture was not a complete one, and therefore was particularly easy to manage after once being set. Added to that, but apart from it in relation to other cases, the apparatus used secures a degree of immobility hardly attainable by other means, and one that would permit safe transport in almost any case, if that should happen to be required; and, in the case of small children, allows their

easy, safe, and therefore justifiable treatment as out-patients —a matter of great convenience, sometimes, to all concerned. The effusion into the knee-joint is not to be wondered at, considering that in making the fracture the articulation must have been submitted to a severe sprain, in spite of the protecting splints around it. Effusion into the knee-joint, or around it, or both, is, in cases of fractured shaft of the femur, a common attendant feature that seems to be hardly ever alluded to. The fact was first made known to the writer during a clinical lecture at the Charité Hospital in Paris, April, 1870, by M. Gosselin, who showed a femur, recently fractured, from a case otherwise speedily fatal, *à propos* of which he said that he had often found cases of fractured femur followed in a few days by effusion into the knee-joint of the same side. Mr. Parker can confirm entirely the observation of M. Gosselin, having found the effusion in almost every case of fracture of the shaft of the femur that he has subsequently seen, and also occasionally in fracture of the upper part of the leg.

Case 2.—*Twist of Lower Limb, corrected by Fracture of Femur and Rotation of Lower Fragment with the attached Leg.*—James V., aged ten, under treatment since January, 1878, for the correction of double knock-knee of an extreme kind. The left limb had already been straightened by gradual extension and lateral compression with bandages on a Thomas's knee-splint; the right was also straight; and both limbs were now in calliper knee-splints with boots attached, but the front of the right knee-joint was turned outwards, and the inner condyle looking forwards. Both tibiæ were compressed laterally and curved in a rickety fashion, but the right was flexible, while the left was rigid. It was thought that fracture of the femur would permit the knee-joint to be turned round to its proper attitude, while the softness of the tibia would permit this to be done without twisting the foot inwards or even breaking the tibia. The knee was accordingly fixed with sheet-iron padded splints, as in Case 1, and the patient put under the influence of ether on Jan. 24th, 1880. The femur was without difficulty broken, a little below its middle, across the edge of the operating-table, and the lower fragment forcibly twisted inwards rather more than was absolutely required, until the knee-joint occupied, without elastic recoil, its proper position, with the patella forwards. The foot was meanwhile easily maintained in its former proper position, owing to the flexibility and thinness of the lower third of the tibia. The limb was put up in Thomas's longer knee bed-splint, with side plasters, short splints of sheet-iron, &c., as in the preceding cases of fractured thigh.

An excellent union, without noticeable incident, had resulted by March 15th of the same year, when a calliper splint, made of full length so as to take a portion of the weight of the body, was replaced.

Case 3.—*Double Bandy-Leg, treated by Antiseptic Osteotomy of both Tibiæ; afterwards by Simple Fracture of one Femur.*—Emma J., aged seven, was admitted in January, 1882, having rather conspicuous bandy-legs, owing to rickety curve of the tibiæ with the concavity inwards. Simple fracture of each leg under ether, Feb. 1, 1882, was first attempted, with the hands pulling the patient's limb acoss the knee of the operator—a method that easily succeeds in some cases. But the bones were too short and too strong for this; so osteotomy with a narrow saw, introduced through a small incision, was at once performed under carbolic acid spray. After sawing through part of the thickness, the fracture of the tibia was completed by hand, a Lister gauze dressing put around the leg, and a couple of sheet-iron lateral splints outside, with a bandage over all. In each case a simple, uncomplicated healing resulted, with a decided diminution of the leg-curve. But when she recovered the strength of her limbs, it became evident that her condition of bandy-leg still remained. On laying her down and placing the upper halves of the thighs in a position of normal symmetry and parallelism, the cause of the bandy-leg deformity was discovered (as in Case 1) to be due to distortion of the femur on both sides. Here, however, the lower ends of those bones were rotated in, so that the inner condyles stood forwards and the outer condyles backwards nearly a quarter of a turn in the attitude in which she lay. The legs in this attitude crossed each other—the ankles, knees, and hips not lying in the same straight line. Accordingly, in the month of June, 1882, under the influence of an anæsthetic, the right femur was broken across the edge of the operating table, the knee-joint having been previously fixed, as in Cases 1 and 2. The lower fragment carrying the leg was rotated inwards, and the limb set in Thomas's bed-splint, as in the other cases. The bone quickly united, and the patient was allowed to go home at the end of July, by which time she could stand upon the limb, the lightness of her weight and the strength of her bones permitting this without further precaution.

As the child had become rather anæmic during her stay in hospital, she was sent to get fresh air until after the vacation. The shape of the limb was now entirely satisfactory as regards general symmetry and the line of the joints, the only drawback being the slight tibial curve still remaining—a defect of no mechanical consequence, only visually recognisable, and not

further remediable. The other limb has not yet been put right, owing to a prolonged absence of the child in a distant part of the country. It is still, however, in contemplation. She was last seen several months after her discharge, the limb retaining all the essentials of strength and efficiency.

Case 4. — *Double Knock-Knee, due to Incurvation of both Femora, corrected by Simple Fracture of each Bone.*—Fred W., aged eleven or twelve, half-brother to the preceding case, was admitted in April, 1883, to have his legs straightened by such means as might seem best suited to his state, and was examined several times. It gradually appeared that in his case the deformity was owing chiefly to incurvation with twist of the femora. On April 27 the right thigh was broken and reset, as in the other cases, the limb being, after sound union, placed in Thomas's calliper splint with boot attached. On June 22 the left limb was broken, and the lower fragment with the leg thoroughly twisted into position. A similar after-treatment was adopted, the patient being sent home at the end of July, walking with a calliper knee-splint on each limb. The result was perfect on the left side, where a much more thorough twist was adopted after fracturing the bone.

About September he was seen again, the left limb being perfectly efficient without splint. In the case of the right the benefit was much less, owing to the defective employment, it is believed, of the twist manœuvre. A refracture was advised, but the patient declined it. Under the circumstances, he was told to continue wearing the splint, keeping the knee-joint in line with leather bandages attached. He has not been seen since.

Case 5.—*Fracture of Left Femur, with Twist of Lower Fragment, to correct Genu Valgum.*—Herbert B., aged five, was similarly treated on July 27, 1883, the fracture being made at or slightly below the middle of the bone. A simple and (after the first day) painless recovery was made, with restoration of the proper line of the limb. He was discharged within a month of operation. The case was one of rickety bend of the tibiæ, the convexity forwards, with genu valgum, pronounced on the left side, but slight on the right. The tibial bends are not a source, apparently, of mechanical inconvenience.

When seen on December 14 he was very vigorous, active, and well able to walk and run. There was a very slight degree of double genu valgum, which it is believed he will grow out of with the use of boots having sloping heels, the inner sides being high. He is still under treatment with that object.—*Medical Times, Dec.* 29, 1883, *p.* 738.

39.—ON TIBIO-FEMORAL IMPACTION; A NEW METHOD OF PERFORMING RE-SECTION OF THE KNEE-JOINT.

By RICHARD DAVY, M.B., F.R.S.E., Surgeon and Lecturer on Surgery to Westminster Hospital and Medical School.

Resection of the knee-joint was originally practised by Park of Liverpool, and especially promoted by the late Sir William Fergusson; it is now generally practised by operating surgeons, except in the case of young children. I myself do not adhere to this exception; my reasons will be given later on. It is somewhat strange that comparisons are still made between excisions of the elbow and those of the knee. The two extremities are diametrically opposed both in function, in operative detail, and wished-for result after the operation. Let me briefly point out some of the many differences. Fergusson pithily states that "the upper extremity is carried; the lower has to carry." One is the representative instrument of the most varied, delicately educated motion; the other, the columnar support in locomotion. The one is active; the other, comparatively passive. In the two operations—excision of the elbow and knee—the first is carried out by a longitudinal, the second by a transverse incision; the elbow-case is set up in the flexed, the knee in the straight position; passive movement is granted to the one, the utmost fixity to the other. And the wished-for result, after an excision of the elbow-joint, is free and complete mobility; after an excision of the knee, the surgeon's aim is absolute and rigid osseous ankylosis. The two extremes meet in common, surrendering the articular ends of their component bones, and leaving somewhat shortened limbs.

I place before you twenty-one cases of excision of the knee performed by myself in this hospital, showing the duration of treatment, the disease, and the results. As you all know, no special antiseptic precautions in the way of dressings are practised by myself; only those which, I trust, are ever at the hands of well-trained, clean, and careful surgeons. A hair-brush will remove discharge painlessly, but, in my opinion, the less a wound is meddled with, the better. By good luck, I have never lost a case of excision at the knee-joint, and have only been compelled to amputate once. This man had extreme rectangular deformity of his knee; and bringing his limb down to the straight line apparently stretched his popliteal artery so far as to cause flattening of its walls and more or less obstruction to the circulation of his leg and foot. Gangrene supervened, and was checked by amputation so planned as to divide only the soft structures which were left undivided by the previous excision. My cases fully corroborate the views of Humphry and Pemberton, with regard to the non-symmetrical

growth of the lower limb, after intrusion on the epiphysial ends of the femur and tibia. The following is the history of my last case.

Susan Burls, aged 16, Brixton, was admitted under my care, on Feb. 5th, 1883. In 1870, when three years old, she was admitted into St. Thomas's Hospital. Mr. Croft excised her left knee-joint for synovitis, set up by a fall on a greasy floor. She recovered; but, shortly after her leaving the hospital, her left leg was drawn back by the hamstring group, and by the superimposed weight of her body, until the back of the thigh rested on and touched the back of her leg. The patten on which she walked measured twelve inches; and she had to stoop on the right leg to accommodate her left contracted one. On Feb. 13th, 1883, I removed a rectangular wedge of bone from her femur and tibia, cut a mortise in the head of the tibia, and shaped the femur as a tenon; placed the femur in the head of the tibia, and applied direct pressure on the left foot, until impaction resulted up to fixity of tenure. The leg was placed in a splint, and, without a single bad symptom, and without any dressings, the patient made a steady recovery. She gained thirteen inches in height, and walks famously with a cork boot. She was discharged cured, June 24th. My colleague, Mr. Macnamara, repeated this operation in my presence on July 14th, 1883; Mr. Macnamara's case had been a long sufferer, and her thigh had been condemned for amputation. She is yet in the hospital.

In discussing the reasons for advocating tibio-femoral impaction in cases of resection of the knee, especially in cases of ankylosis, or relapsed cases, let me impress on you two grand maxims bearing on this operation:—1. Maintain the bones in absolute fixity. 2. Do not meddle with the case from the day of operation until recovery is established.

By this new method of tibio-femoral impaction, osseous ankylosis (so to speak) is established before the patient leaves the operating table; and many surgical contentions are removed, such as the misplacement of the bones by startings, jerks, or inefficient bandaging. In one case the boy had convulsions for twenty-four hours after the operation; and, thanks to the sister's and my own bedside restraint of the ends of the bones, grating injury was partly prevented. The circumstance made a very forcible impression on my mind; and I consider that tibio-femoral impaction relieves the surgeon from this grave source of anxiety. I have constantly seen an excision case neatly and accurately adjusted on the operating table, displaced antero-posteriorly or laterally by the time the bedside is reached; due to the transit of the patient and involuntary spasm; and what surgeon worthy of the name has not felt a

pang at so quick a secondary interference? Place your patient's limb at once in a swing cradle, hitching up the side-irons to a convenient height, and, so far as possible, in a position comfortable to the owner. The splint used by me in the above case is a very excellent one for the purpose; fixing the knee, the foot, and the limb; with wide margins at the heel, ankle, and knee; it is capable of the most accurate adjustment. And then, do withhold your interference, either by dressings or readjustments. If your antiseptic dressings are potent enough to kill the supposed germs, they run a risk of killing your patient; cleanliness is all that is wanted; and, in my opinion, the only advantage gained by the antiseptic method is to remind the careless to be careful. There are some who accept the variegated light of a stained glass window, and clerical formalities, as accessories to religious fervour; there are others who can do their duty perfectly well without them.

Lastly, we must allude to the comparisons which are made between the remnant after an excision of the knee, and a stump after amputation of the thigh. In my judgment, decision must be given in favour of the remnant after excision, both in length of limb, utility, and even appearance. Some surgeons say that the intrusion on the epiphyses in excision of the knee interferes with the growth of the limb, and that such dwindled limbs prevent their performing this operation on children. Does not amputation of the thigh, by one fell swoop, interfere far more with the growth of the limb? Is not even half a limb better than no limb at all? Tibio-femoral impaction secures osseous ankylosis, and prevents relapsing distortion; and is not a human foot at the end of an osseously fixed limb (shorten it as you please) the best finish? Does there exist such an enthusiastic machine-maker as will pit his contrivance, however ingenious, against his Creator's model? I protest, in the plainest English at my command, against any operator pruning a limb so as to fit the stereotyped patterns of any tradesman. And with reference to appearance, I have never yet seen a stump so graceful as to drown the floating thought "abruptly unnatural." Strip the two cases naked, excision of knee, and amputation of thigh; the former will be less likely to offend our senses than the latter.

I must take exception to a common error, quoted by Fergusson and other surgeons, in comparing the advantages of excision of the knee with an amputation of the thigh. Fergusson speaks of an amputation of the thigh as "a formidable operation which involved great risk to life, and included the actual loss of wellnigh *one-fourth* of the frame." Feeling how exaggerated this argument was, I took the weight of an emaciated woman (*post mortem*); then amputated her right thigh as high up as the trochanters permitted, and weighed the limb. I found the

proportion in pounds was as 56 (the whole body) to 6 (weight of the limb); so that the proportion relatively is reduced from one-fourth to about one-ninth or one-tenth.

I trust that in these comments on resection of the knee I have pointed out a mechanical plan of treating these operations which will help to ensure success, prevent relapse, and render the operation available for young persons. The same method of impaction is applicable also to ununited fractures, and will, may be, lead to further improvement in the practice of our surgical art.—*British Med. Journal, Oct.* 20, 1883, *p.* 758.

40.—ON THE TREATMENT OF FLAT-FOOT.

By W. J. WALSHAM, F.R.C.S., Surgeon-in-Charge of the Orthopædic Department, St. Bartholomew's Hospital.

The boot represented in the accompanying woodcut is one which I have found of much service in the treatment of certain forms of flat-foot in the orthopædic department of St. Bartholomew's Hospital. It differs from the boot with out-side leg-iron in ordinary use, inasmuch as in place of the T-strap I have substituted a broad band of solid rubber, so that continuous elastic tension is exercised on the sunken arch. The rubber band is firmly secured to the "uppers" inside the boot along the outer border of the sole in such a position that as it crosses under the sole of the foot its centre corresponds to the middle of the calcaneo-scaphoid ligament. It is then carried up on the inner side of the foot to just above the top of the boot, and thence, through the medium of a leather strap and buckle, secured to the calf-piece. A soft valgus pad is slid over the rubber strap, and so adjusted as to correspond, when in position, to the situation of the yielding arch. In place, therefore, of a passive valgus pad to support the arch, active traction through the medium of the pad is exercised on the depressed bones by the rubber strap. For convenience of treatment, ordinary forms of flat-foot may be divided roughly into three degrees. In the first, in which little yielding of the

ligaments has taken place, tip-toe exercise, combined with circumduction of the ankle, will generally be found sufficient to produce a cure, if the patient will wear a well-formed laced-up boot with a soft felt valgus pad, and is able to reduce somewhat the hours of standing. In the third form, in which the arch is completely sunken and there is much rigidity of the foot, I know of no treatment which answers so well as that practised by Mr. Willett, and described by him in the eighteenth volume of St. Bartholomew's Hospital Reports — namely, thorough wrenching of the foot under an anæsthetic, and then placing it in a plaster-of-Paris case in a position of extreme inversion, with the bones forming the arch forced well into place. In the second form, in which the deformity is well-marked, but is unaccompanied by rigidity, I have obtained the best results by the boot above described. I have tried it now in upwards of a dozen cases, and in every instance the patients have expressed themselves as experiencing great comfort from its use, and have obtained permanent benefit. The boot was made for me by Messrs. Arnold and Sons, of West Smithfield.—*Lancet, Jan.* 26, 1884, *p.* 155.

ORGANS OF CIRCULATION.

41.—CASE OF TRAUMATIC ANEURISM OF THE PALM.

By E. Bellamy, F.R.C.S., Surgeon to Charing Cross Hospital.

The treatment of every case of wound of the vessels in the palm is a problem to be solved, and is important as a surgical record. The introduction of Esmarch's bandage has revolutionised the older treatments of wounds of the palm. Its application admits of a studied and careful dissection in search of the bleeding point or points, which with ordinary anatomical knowledge and manipulative skill should be found. Tentative ligature of the radial, ulnar, interosseous, or even median, and the last severe resort of ligature of the brachial, are assuredly in the highest degree unwarrantable at an early stage. Added to which, if the operation be conducted on strict antiseptic principles, there is no dread of mischief after searching about in the palm.

A. B——, a fine young man, aged twenty-three, came into the hospital, having been injured in the palm by some broken glass, the result of a cab accident, on Sept. 26th. There was free hemorrhage from the wound, spirting from a gash in the usual course of the ulnar portion of the superficial arch. Pressure, however, on both ulnar and radial vessels at the wrist did little to control it; consequently it was supposed that there was an enlarged median, which supplied the blood.

Mr. Bellamy passed a stout hare-lip pin beneath the supposed site of the bleeding point on either side of the cut in the hand, and with the effect of completely controlling the bleeding for the time being. The needles were removed on the fourth day. All went well for fourteen days, when, possibly, after using the hand too soon, a traumatic aneurism developed in the palm, and the patient returned to the hospital. He was told to remain in, but preferred to go home for the night and return early for treatment next day. On his way by train the tumour gave way, with profuse hemorrhage; this he stopped by pressing his finger on the bleeding point until he came to the hospital. He was taken to the operating theatre, and, an anæsthetic being given, an Esmarch's bandage was applied, strict antiseptic precautions being adopted. An incision was made down upon the sac, the clot was turned out, and the source of bleeding sought for, which was enlarged by a transverse one across the palm to get more room. Fortunately it was speedily found—a longitudinal slit in the course of the trunk of a somewhat irregular distribution of the ulnar artery, just in front of the furrow, between the commencement of the thenar and hypothenar eminences. A catgut ligature was applied, with an aneurism needle above and below the wound in the vessel, and the vessel itself divided between the points of ligature. The Esmarch bandage was then removed, an assistant having command of the brachial. No bleeding occurred from the ulnar, but presently a somewhat profuse hemorrhage came on from the surrounding cut tissues and deep structure. This was undoubtedly from enlarged anastomotic vessels. The bleeding points were tied or torsioned, and when all oozing had ceased the wound was plugged with a small carbolised sponge, and Listerian compresses and bandages applied. A dorsal splint was adjusted, and the limb slung on an extension boom over the bed's head. The dressings were examined antiseptically on Monday, the 15th, and all bleeding had ceased, the wound looking healthy and well.—*Lancet*, *Oct.* 27, 1883, *p.* 725.

ALIMENTARY CANAL.

42.—REMOVAL OF THE TONGUE BY MEDIAN DIVISION.

By W. Morrant Baker, F.R.C.S., Surgeon to St. Bartholomew's Hospital, and to the Evelina Hospital.

In the Lancet of April 10th, 1880, I drew attention to an operation for removal of the tongue, which seemed to me well adapted for the larger number of the cases in which it was advisable to remove this organ, wholly or in part, with the

écraseur. Since that date, I have continued to employ it, in preference to any other, in most of the cases on which I have operated; and I still think, with increased experience, that it will be found more generally applicable than any other.

I will assume that section of the bone is not necessary, and that the operator has decided to use the *écraseur*. Under such circumstances, the following is the plan which I believe is the best to be adopted.

A gag having been introduced, and any jagged teeth likely to be in the way of the operator having been extracted, two threads are passed through the tongue, about an inch behind the tip and half an inch on each side of the middle line. One of these looped threads is now given to an assistant to hold tightly; and the operator, holding the other, scores the dorsum of the tongue with a blunt-pointed scalpel, exactly in the middle line—extending the "cut" well through the mucous membrane into the surface of the muscular substance, and dividing the tip freely down to and through the middle line of the frænum. The cut may be extended back as far as the operator deems necessary—say, for an inch beyond the level of the posterior edge of the cancer. He then takes both threads, one in each hand, and, using the forefingers much in the same way that he would for tightening a ligature on a deep vessel, he splits the tongue into two halves. At this stage of the operation, the hemorrhage is usually very trifling, if the operator has taken care to cut along the middle line; and, even if he is a little to one side or the other, the divided vessels are small and easily ligatured. The thread which tethers the diseased half of the tongue is now pulled quite taut, either by the operator or his assistant; while the former, with blunt-pointed scissors, snips, as far as he considers necessary, the mucous membrane and muscular fibres which connect the tongue with the anterior part of the lower jaw behind the symphysis, after the manner suggested many years since by Sir James Paget. He then "runs" the scissors along the floor of the mouth, immediately beneath the mucous membrane, keeping close to the ramus of the jaw, until he has cut, if possible, to a point beyond the level of the posterior edge of the cancer. Then with his forefinger and occasional snips with the scissors, he frees the tongue as completely as may be requisite from its attachments in front and at the sides and in the floor of the mouth. The chief point aimed at, of course, at this stage of the operation, is to free the diseased half of the tongue in such a manner that it may be surrounded by the loop of the *écraseur* at some distance behind the disease, and without danger of the cord slipping forward so as to embrace the neighbourhood of the cancer, and much less the cancer itself.

This is by far the most important part of the operation; and, should the surgeon be in doubt about his having sufficiently freed the tongue with his finger, he should again introduce the scissors, and cautiously divide any muscle or other structure which prevents the due loosening of the tongue. Having now freed the tongue sufficiently, one, and sometimes two, blunt curved needles (of the pattern shown) are now made to perforate it at some distance, an inch, or more if possible, behind the cancerous mass; and the loop of the *écraseur* is now slipped over the diseased half of the tongue, and adjusted behind the needles. With the screwing-up of the *écraseur*, this part of the operation is now completed, with the exception that, very commonly, at least when whipcord is employed, the main vessel and some other tissue, perhaps nerve-fibres, are pulled through the end of the *écraseur* after the softer substance of the tongue has been crushed through. Under these circumstances, a double ligature should be passed with an aneurysm-needle, and the strand of vessels and nerves divided between the two knots, when the *écraseur* will, of course, at once come away, and the main vessels will be left on the face of the stump securely ligatured.

In the event of both sides of the tongue requiring removal, an *écraseur* should now be slipped over the other half after it has been sufficiently freed from its attachments, and the diseased part guarded by a blunt-pointed needle. This part of the operation, on account of the space gained by the removal of half the organ, can be performed with comparative ease and rapidity.

After the removal of the tongue, wholly or in part, as the case may be, it should be carefully examined with reference to the question of how much healthy tissue has been removed with the cancer; and the floor of the mouth and stump of the tongue should be carefully examined also, with the same object in view. In freeing the tongue from the floor of the mouth, portions of mucous membrane, sublingual glands, and the like, are often loosened; and these can be readily dissected away when space has been gained by removal of the tongue. Lymphatic glands should also be searched for, especially in the submaxillary fossa. Should any be found, now or previously, an incision should be made through the skin over them, and they should be carefully enucleated.

In many cases, the removal of the tongue is greatly facilitated by previously dividing the cheek from the angle of the mouth to the anterior border of the masseter—a little below the line of the parotid duct—as recommended by Collis, Gant, Furnaux Jordan, and many others. This should be, I venture to think, always done if the disease extend far back.

The scar is afterwards but trifling, if a little care be taken in applying the sutures of union. It is often advisable, especially when the disease has advanced into the mucous membrane of the floor of the mouth, to extract three or four of the neighbouring teeth from the lower jaw; and, when the disease approaches or invades the gum, much valuable space may be gained (much more than would be imagined by one who had not done it) by cutting away also a portion of the alveolar border of the lower jaw.

With regard to the *écraseur*, the choice of instrument is a matter of secondary importance; at the same time, it is not unimportant altogether. The instrument which I have been in the habit of using of late is of very moderate length and weight, and is somewhat curved on the flat near the end. (Pattern shown.) The pattern is almost identical with that which my colleague Mr. Harrison Cripps has recommended for removal of the lower end of the rectum; but I prefer working both limbs of the looped cord at the same time, and therefore have a double instead of a single hook, and have no perforations at the shoulder of the instrument. The material of the cord which I much prefer to any other is a thick kind of whipcord. (Specimens shown.) It is more easily manageable than any kind of wire, and very much more than the linked chain. For some years past I have not met with any case in which the cord has broken under the strain of cutting through the tongue; nor have I ever had, so far as I can remember, any case of recurrent hemorrhage after the operation. This last advantage I am inclined to attribute partly to the fact that a whipcord or wire loop, and more especially whipcord, will usually, after the tongue has been crushed through, drag through the end of the *écraseur* a small strand of tissue containing the chief vessels, to which a ligature can be applied before the removal of the *écraseur*. The being able to tie the main vessel at the end of the operation enables the operator to screw up the *écraseur* more rapidly than he would have otherwise ventured to do. I think it is a good plan to apply a ligature to the main vessel, if it can be seen on the face of the stump, if it has not been tied before the removal of the *écraseur*.—*British Med. Journal, Oct.* 20, 1883, *p.* 765.

43.—NASAL POLYPI—NEW POLYPUS RING-KNIFE.

By W. Spencer Watson, F.R.C.S.Eng., Surgeon to the Great Northern Hospital, London.

In the removal of polypi, whether by snare, forceps, or cautery, it is very difficult to be quite sure that the whole of the growths have been extracted. It is probably due in part to this uncer-

tainty that polypi are so liable to recur. Often no doubt rootlets or fragments of one or more of the growths remain behind. If therefore we can by more thorough extirpation avoid this uncertainty the chance of recurrence is so far diminished; for though it is possible that the diseased mucous membrane has a tendency to reproduce the same morbid overgrowth, yet, *cæteris paribus*, the more complete the operation the less will this tendency show itself. The object then to be attained is to detach the polypi as close to the bone as possible, and it is even better in some cases to remove a portion of the turbinated bones with them. It is generally tolerably easy to get away those polypi which hang near the anterior apertures of the nostrils, but for the complete removal of those more deeply situated the usual methods are often insufficient. To meet this difficulty I have devised the polypus ring-knife (made by Messrs. Krohne and Sesemann). It consists of a rod of softish steel (which allows of being somewhat bent to any desired curve) which, with the handle and the ring-knife, measures eight inches and a half. The handle resembles that of a door-key, and is large enough to admit two fingers; at the other extremity is the knife, of oval form and one inch and a quarter long, being at its widest part five-eighths of an inch broad. The outside of this ring is thick and blunt, its inside bevelled, and with a cutting edge extending round the semicircle farthest from the handle. The knife when used is passed along the lower part of the nostril with its sides parallel to the septum, until it reaches the posterior aperture of the nares. At the same time the forefinger of the left hand is passed behind the velum palati and hooked up in the posterior aperture of the nostril. If there are any pendulous portions of polypus in the pharynx they can now, by a little manipulation, be slipped through the ring of the knife, which is then directed by the finger towards the outer wall of the nostril. The instrument is then slowly withdrawn, and, as it passes forward, is made to scrape away the polypi from their attachments to the bone. The operation is necessarily painful, and can be best done under an anæsthetic, the mouth being kept open by the use of a Mason's gag. The instrument thus used can be directed with considerable precision, and is, I think, preferable to forceps, when the polypi are deeply seated, and especially when of the sarcomatous or firm myxomatous variety. If the antrum is involved, the blade may be passed into it after the curve of the shank has been somewhat altered. But to reach the extreme depths of this cavity the ring-knife used by Meyer for adenoid vegetations of the pharynx is well adapted. I have succeeded quite recently in clearing out the antrum with these two instruments in a case of recurrent myxo-sarcomatous polypi, without laying open

the alæ nasi. In this case, however, I followed up the treatment by the application at intervals during several months after of the acid pernitrate of mercury to spots on the surface of the mucous membrane, at which there seemed a tendency to return of the growths. The application of nitric acid, or acid pernitrate of mercury or similar fluid escharotic, in such a narrow channel as the nostrils seems at first sight a somewhat formidable and dangerous proceeding; but when carefully done with the aid of the platinum cannula, and under a good light from the short-focus mirror, the proceeding is not really dangerous nor painful. The platinum cannula is guided carefully to the spot to be cauterised. A pencil of wood previously dipped into the acid is then passed along it, and when it reaches the aperture in the cannula is made to press against the diseased tissue. The surrounding parts are thus completely protected, and if the point charged with the acid is again drawn into its sheath before the instrument is withdrawn, only a limited area of mucous membrane is touched. A slough, of course, forms, and becomes detached in the course of a week, or less. This plan has succeeded very well in some of my cases. It should, I think, be employed in all cases of polypi, whether gelatinous or sarcomatous, after the removal of the principal mass, but, of course, only after such an interval has elapsed from the time of the first operation as to allow of all swelling having subsided, and so to enable the operator to get a clear view of the parts with the rhinoscopic mirror. From three weeks to a month from the first operation is about the best period. It is, I think, only by repeated applications at intervals of a few weeks for several months that we can hope for a satisfactory result. I am not prepared to say that this plan is never followed by recurrence of the diseased growths, but I think it offers a good prospect of retarding it in all cases, and it has certainly appeared to me to delay the recurrent form of polypi from reappearing for an indefinite time.—*Lancet, Feb.* 23, 1884, *p.* 336.

44.—ON THE RADICAL CURE OF HERNIA BY PERITONEAL AND INTERCOLUMNAR SUTURE.

By WILLIAM STOKES, Professor of Surgery R.C.S.I., Surgeon to Richmond Hospital, Dublin.

The object of the various operations hitherto proposed and advocated is, in fact, to imitate what Nature does when she effects a cure unaided by surgical art—viz., obliteration of the neck of the sac, combined with approximation and union of the tendinous structures about the hernial passages. This is the principle embodied in the invagination operation of Wützer,

in the ingenious but complicated method of Wood, in the transplantation method of Dzondi, in the treatment of local irritation combined with pressure by the method of Belmas, of irritation in the sac by means of goldbeaters' skin and bits of gelatine, by injection of iodine (Pancoast), by scarification (Velpeau), by the seton (Riggs), and lastly, by the so-called method by "dissection," which has the great advantage of enabling the surgeon to deal directly, not alone with the sac, but also with the tendinous structures of the hernial passages. Of the operations performed on the sac, several have been mentioned by Prof. Annandale and others. Among these are:—

1. The ligature of the neck of the sac alone.
2. The ligature of the neck of the sac, and invagination of the ligatured sac into the abdominal cavity.
3. The ligature of the neck of the sac, and excision of the sac below the ligature.
4. The ligature of the neck of the sac with excision of the sac, and stitching together the margins of the abdominal opening (Annandale).
5. Ligature of the neck of the sac close to the internal ring, so as to make the peritoneum flush over the inner opening (Alexander).
6. Division of the sac into two halves, except at back where it adheres to the cord, one-half folded down over the testicle, the other rolled into a sort of plug, which was pushed into the internal abdominal ring (Buchanan).
7. Closure of the canal and pillars of the ring by a subcutaneous cross-suture (Fitzgerald).

It will be observed that in the first five of these operations the closure of the neck of the sac is brought about by the application of a ligature, and that in three of them excision of the sac is a prominent feature of the operation. Let us consider what this necessitates, and whether the same result as regards the hernia may not be obtained by simpler means, and means less likely to be attended with serious local and constitutional consequences. It necessitates a tedious and difficult dissection; for everyone conversant with hernia knows that, as a rule, the detachment of the sac is much easier in theory than in practice, and that to accomplish it a great deal of what Mr. Mitchell Banks terms "mauling," is required. Though I should be sorry to apply to this and to excision of the sac such forcible epithets as "repulsive" and "barbarous," still it must, I think, be considered unsurgical, for the simple reason that it is unnecessary, and may be fraught with much secondary local trouble, and possibly constitutional peril.

The great amount of disturbance of the parts consequent on making a sort of artificial tunica vaginalis, as in the operation

of Prof. Buchanan, and the danger of making undue pressure on the cord in the operation of Dr. Fitzgerald, would make me hesitate to adopt either method.

The plan which my colleagues and I in the Richmond Hospital, where such exceptionally large numbers of ruptured persons are inspected at the monthly distribution of trusses, have of late adopted in suitable cases, is not the application of a ligature *en masse* round the neck of the sac, or this procedure coupled with excision of the sac below the ligature, but, I believe, a simpler and, at all events, equally efficacious procedure. It consists in the insertion through the opened neck of the sac, and close up to the external abdominal ring, of a deeply-inserted carbolised catgut suture or sutures, according to the size, width, and depth of the neck; and this is followed by the approximation or closure of the canal and pillars of the ring by the insertion of two or more sutures of a stronger and more durable material, such as chromicised catgut, carbolised silk, or silver wire. It is, in fact, a dual system of suture, one being peritoneal and the other intercolumnar. I believe that in the great majority of cases this procedure will be found to be attended with satisfactory results, always provided that rigid Listerian antiseptic precautions are taken during and subsequent to the operation.

I may now state the particulars of a few cases of hernia, taken among others from my case-book, which will fairly illustrate what I have just observed.

Case 1.—A female, aged 40, was admitted July 19, 1882, suffering from strangulated inguino-labial hernia of unusually large dimensions. Previously the tumour had frequently appeared, but there had never been any difficulty in its reduction. Four days before her admission into hospital the hernia had come down, and became very painful. She made the usual attempts to reduce it, but without success. On the following evening she came to hospital, when the resident surgeon succeeded in reducing it, and applied a compress and spica bandage to prevent its recurrence. She then, contrary to advice given, left the hospital, and on the day following the tumour reappeared, but no surgical aid was sought for until three days had elapsed, when she was admitted again into the hospital with distinct evidence of strangulation. The tumour was much larger than when she first sought relief, and was much more tense and painful. All the usual symptoms and signs of strangulation were present, and in a marked degree. Taxis was carefully employed while the patient was in, and after she was taken out of a warm bath; also when she was under the influence of an anæsthetic. But, all attempts failing, I was then sent for, and at once determined upon performing herniotomy.

On opening the sac, and exposing the protruding intestine, I found it of a dark brown, chocolate colour—so discoloured, in truth, that after division of the stricture I had some hesitation in reducing it. However, I did so, and then introduced two fine carbolised catgut sutures through the neck of the sac, one a deep one and the other superficial, uniting its divided edges. Two other sutures of strong, thick carbolised catgut were inserted by means of a nævus needle through the pillars of the ring, on securing which the opening, save at its most inferior and internal part, was found to be effectually closed. The edges of the wound were thus united by several points of interrupted suture, and a small drainage-tube inserted. The strictest antiseptic precautions were taken throughout. It is unnecessary to give an account of the daily progress to recovery of the patient. With the exception of the formation of an abscess in the labium nothing untoward occurred. The rupture never reappeared, and when she coughed there was little or no impulse communicated. On August 2nd she left hospital and returned home, and I had frequently an opportunity of seeing the patient subsequently, examining the situation of the hernia, and satisfying myself of its non-recurrence.

Case 2.—D.M., aged 44, house painter, a strongly-built man of medium height, was admitted Nov. 19, 1882, suffering from strangulated inguinal hernia on the left side. By a curious coincidence he had suffered from strangulated hernia five years previously on the right side, and underwent an operation for its relief at the hands of Mr. Bickersteth, of Liverpool. On examination I found a large inguinal hernia on the left side, the abdomen somewhat tympanitic, and the tumour painful. The strangulation was, according to the patient's account, apparently of two days' duration. He suffered much from hiccough and vomiting, and the other usual signs and symptoms of strangulated intestine. The tumour was very hard, and its integumental covering tense—so much so, that from the first I did not anticipate that taxis, or anything short of herniotomy, would be likely to relieve the patient. Taxis was tried, but, as I expected, proved unavailing. I accordingly cut down on the tumour, and on opening the sac introduced my finger and found that the stricture was not an exceptionally tight one, but, owing to the enormous coil of intestines which had escaped, reduction was found to be impossible without division of the stricture, which was done by Dr. Corley's hernia knife. Even after this reduction was very difficult, and only effected after a very tedious and protracted effort. There was not much intestinal congestion or inflammation, which was remarkable considering the acute symptoms of strangulation which were present. I then inserted two sutures, as in the former case, through the

neck of the sac, and two more of strong chromic catgut through the pillars of the ring, and then closed the wound.

The result of this case was as satisfactory as the former. Some months after the operation I saw the patient, who was so pleased with the result that he urged me very strongly to operate on the other side in order that he might be able to dispense with the truss which he was obliged to wear to keep up the hernia there. I did not, however, at the time see my way to acceding to this request.

Case 3.—The importance of using a more durable material than catgut, whether carbolised or chromicised, for stitching the pillars of the ring, is well illustrated in the following case. William W., aged 3, a well-nourished male child, was admitted August 12, 1883, on account of an exceptionally large congenital inguino-scrotal hernia. This had of late greatly increased in size, and was quite as large as a full-sized Jersey pear. No difficulty attended its reduction, and when this was accomplished the external abdominal ring was found to be so large as to easily admit the points of two fingers. No pad or bandage could retain it for more than a few hours. On August 15 I performed an operation with the view of obliterating the neck of the sac and closing the ring. Having reduced the hernia, I made a free integumental incision, commencing from without at a point about a quarter of an inch external to the internal ring, and carrying it downwards and inwards for a distance of fully two inches. The tissues were then carefully divided on a Fergusson's director, as in the ordinary operation for strangulated hernia, down to the sac. This was opened immediately below the external ring, and the divided edges held well forwards with catch forceps to enable two deep sutures to be inserted, which kept the opposing inner surfaces of the sac in opposition, and in that way the neck was closed. I then approximated the edges of the external ring by a strong, chromicised catgut suture, introduced through the external pillar and brought across the ring and through the internal pillar at some distance from its edge. Superficial interrupted sutures were then inserted and the wound dressed with careful antiseptic precautions. After the operation the case progressed satisfactorily, the wound healed readily, and I then was pleased to find that the parts were so matted together and the ring closed so as to effectually prevent the descent of the hernia. The patient was kept, by my directions, for fully a month after the operation in order that I might observe if it was likely to be a permanent success, and things remaining in the same satisfactory condition, I allowed the patient to be taken home. Three months subsequently I was much disappointed at learning from the mother of my patient that the hernia had reappeared, and

had done so suddenly the day previously while straining at stool. Subsequently I saw the patient, and finding the mother's statement was substantially correct, urged on her the desirability of having the operation repeated, but she declined to accede to this proposal. Should she, however, eventually alter her mind in reference to this, I will, in the first place, use chromicised gut for stitching the neck of the sac, and close the canal and external ring by silver wire sutures. Had I done so in the first instance I believe the cure would, in every sense of the word, have been a radical one.

Case 4.—The result in the following case was more satisfactory. Mary B., aged 48, a delicate-looking woman, was admitted on the 21st of last May, suffering from a strangulated inguino-labial hernia of exceptionally large size. It was fully the size of a cocoa-nut. It had recently, she stated, greatly increased in size, having been, a short time previously to her admission into hospital, only about the size of an egg. She complained greatly of pain, which she referred mainly to the region of the umbilicus; also of nausea and vomiting, of which she had had several attacks shortly before coming into hospital. The tumour was very hard and painful. On this occasion I succeeded in reducing the hernia after the use of warm baths and careful taxis. A day or two after the patient left the hospital without any authorisation. On the 26th of May, however, she returned to hospital suffering more acutely from strangulation than on the former occasion. Taxis, employed as before while the patient was in a hot bath, and again after she was taken out of it, did not succeed; nor did any better result attend the operation when tried subsequently by Dr. Corley and myself, the patient being under the influence of ether. I accordingly performed an operation similar in its details to those already described—viz., exposure and opening of the sac, division of the stricture, reduction of the protruding intestine, stitching the neck of the sac, the insertion of intercolumnar sutures (in this case two being employed), and finally closing the skin wound with numerous points of interrupted suture, a small drainage-tube being inserted and left in the lower angle of the wound. The healing of the wound pursued a perfectly aseptic course. On June 3rd the patient returned home, and since then has been frequently inspected, and no evidence of any return of the rupture observed.

Although these cases are few in number and insufficient to enable me to speak dogmatically of the radical cure of hernia by an operation which may be termed peritoneal and intercolumnar suture—a title suggested to me by my colleague, Dr. T. Stoker—still, as far as the cases go, they are of much interest and surgical importance, especially taken with others operated

on in a somewhat similar way by my colleagues; and I think it is not too much to say they should make us, if not confident, at least hopeful that we are working in the right path towards determining the treatment that is most likely to prove efficient in the permanent cure of one of the most serious ills to which man is liable—one which in youth and early manhood renders the enjoyment of athletic exercises unsafe, prevents the sufferer entering most branches of the public service, and at times renders his life utterly miserable, from the lasting annoyance of a truss, and the constant dread of strangulation.—*Dublin Journal of Medical Science, Feb.* 1884, *p.* 97.

45.—RADICAL CURE OF HERNIA—THE DIRECT METHOD. By JOHN K. BARTON, F.R.C.S., Surgeon to the Adelaide Hospital, Dublin.

Wood's operation is a clever combination of the plan of invagination with direct closure of the internal ring, and it is chiefly upon this latter that its success depends. If any part of the inguinal canal be left open, the hernia will descend, so far as it is open, through it, and when it has done so, it will form the thin edge of a wedge, which will, in time, press down and overcome any obstacle which invaginated fascia or skin may present, and thus reproduce the hernial protrusion; but, if the internal ring be completely and permanently closed, this cannot take place. If this reasoning be true, it follows that Wood's operation may, with advantage, be simplified by omitting the invagination part and taking care that the closure of the ring be really accomplished. This, by his subcutaneous method of operating, cannot be done satisfactorily, at least by hands less practised than his own, and therefore, if the radical cure of inguinal hernia is to be practised by surgeons everywhere, it becomes necessary to institute for Wood's method of operating one at once more simple and more sure. This is found in the *direct method.* Prof. Gross of Philadelphia thus describes this operation as practised by him:—"The most rational radical treatment of hernia is undoubtedly the direct, as it may be termed, consisting in cutting down upon the parts, refreshing the edges of the opening of descent, and approximating them with wire sutures, retained either permanently or until complete consolidation has been effected. The operation, it will be perceived, is founded upon the same principle as that for hare-lip and cleft palate, and will, if properly executed, be much more likely to answer the purpose than the process of invagination, now so much in vogue, and for the most part so worthless." Prof. Gross had performed this operation twice, with encouraging success. The special features of this operation are:—

First, it is open; the surgeon sees exactly what he is doing, and can, with certainty and precision, draw the pillars of the ring into close contact. Secondly, it closes the opening through which the hernia descends at its abdominal aperture, and not in the canal. Both of these are important points which recommend the operation as one likely to fulfil the requirements of the case; and if we can add from experience, that it is at once safe and permanently successful, then we have all we can desire in the way of an operation for the radical cure of inguinal hernia.

I now relate the particulars of three cases operated upon by me by this method, with the difference from that described by Prof. Gross, that in no case did I refresh the edges of the ring, but simply drew them into close contact by strong silver wire, which in one case only was removed, and may, I believe as a rule, be left in with decided advantage.

Case 1.— A boy, aged between 2 and 3 years, was brought to me in April, 1882, from Newtownbutler, with a note from Dr. Fitzgerald, asking me to see if anything could be done for a large inguinal hernia on the right side, which he had failed to keep up by any means, having in vain tried to do so with a variety of trusses. On examination I found a large scrotal hernia, nearly the size of the child's head, on the right side; it could be reduced after some manipulation, but the ring was so wide that it was impossible to keep it up when the child cried or coughed; trusses had been abandoned as useless. The child was a remarkably fine vigorous boy, one of twins; the birth was difficult and prolonged, and when, at last, this child was born, the nurse noticed the hernial protrusion; it had probably been produced during the birth. On the 15th of April, a few days after his admission, the note taken by the dresser states that when the child was crying the hernia descended almost to his knees. On the 18th April I performed the operation with every Listerian precaution. An incision, two inches in length, was made obliquely from above downwards and inwards, its upper extremity corresponding to the internal ring; the fascia was carefully divided upon a director, and when the internal ring was reached the index finger of the left hand was introduced into it, so as completely to prevent the descent of the hernia, and, at the same time, to regulate the next step, which was the introduction of the wire suture; and for the remainder of the operation the finger maintained this position. A curved needle, with the eye close to the point, was then passed through the inner pillar of the ring (care being taken not to introduce it too near its free edge), and, guided by the left forefinger, was safely carried across the ring and through the outer pillar from behind forwards; a strong silver wire was then passed through

the eye, and the needle was withdrawn; thus the first wire stitch was introduced, and similarly a second—only two were placed in this case—the finger was then withdrawn, and the wire was tightened, drawing the sides of the ring into close contact. When firmly secured by twisting, the cut ends were carefully bent down so as to lie in the axis of the wound, and not project either forwards or backwards. Drainage was provided for by a few catgut threads, the wound was then closed, and dressed with protective and gauze; three drops of liq. opii sed. was administered, and the child removed to bed; the temperature was 100·5° in the evening. 19th. Morning temperature, 99·8°; evening, 100·4°. 20th. Morning temperature, 99°; evening, 100°. The wound dressed antiseptically; looked very well; bowels moved twice. 21st. Morning temperature, 100·2°; evening, 101°. 22nd. Wound dressed; a little pus was found; scrotum was swollen on right side; morning temperature, 100·2°; evening, 100·2°. 25th. Morning temperature, 98·6°; wound rather open.

The wound slowly granulated, and on 15th May had almost quite healed, but would not completely heal. Evidently the wire was keeping it open, but I refrained from any interference with the wire. The child was allowed up on May 26th, when the hernia came down a little. He was then confined to bed, and a month passed, during which, although he was always jumping about, and continually shouting, and frequently crying, no protrusion took place. Early in July the wound became inflamed, and opened, and I then thought it best to remove one wire stitch, the twisted end of which was found projecting in the wound. After this the wound healed soundly. I then had a light truss made upon the plan of Lestrange's, and allowed the child up. No further protrusion took place, and he left hospital and returned to the country, where, as I was informed, he remained well, and able to wear the truss. Quite recently, however, I have had a letter from Dr. Fitzgerald, in which he tells me that the operation has not proved a success, as the hernia has returned, and now descends into the scrotum, but whether it is capable of being held up by a truss or not he does not say.

Case 2.—Mr. K., aged 20, a remarkably muscular and healthy young man, came to me in the month of July, 1883, stating that, being desirous of obtaining a commission in the army, he had prepared himself for the examination, but previous to his admission to which he was submitted to a physical examination, when a small hernia was discovered, of the existence of which he was ignorant before, and he was told he could not be received. He was informed, however, by Surgeon-General M'Kinnon, that if the hernia was radically cured he would pass him. Under these circumstances he

applied to me, and I did not hesitate to recommend him to undergo the direct operation. The hernia being a small, reducible, left inguinal one, and the patient being in splendid health, and a teetotaller, the operation was performed upon the 31st of July; two strong silver wire sutures were introduced. He suffered rather severe pain in the abdomen for two or three days, but his temperature did not rise above 99°; the pain was relieved by hot poultices externally, and half a grain of opium three times a day internally. The wound had completely healed on the 20th August, after which he was allowed up with a light truss on. I did not see the patient at this time, as I had left town for a holiday, but when I returned in September he called upon me to say that a few days after I last saw him a slight protrusion had taken place below the situation of the sutures, and that whenever he took off the truss the hernia appeared there. Upon examination I found that it was so, and I concluded that two stitches were insufficient in this case, and must be supplemented by another, or, perhaps, two more. The patient was anxious to have the operation completed as soon as possible—so on the 27th Sept. a second operation was performed; the lower wire, inserted at the first operation, was found and another put in close to it, and a second at a little distance further down. When these were tightened the opening was most securely closed, but the aperture left for the cord was so small that I feared some inconvenience might follow—but, anxious to secure the success of the operation, I left it as it was. The case was throughout dressed with Listerian antiseptic dressings. A rather smart swelling of the testicle and scrotum followed the second operation, but in twenty-four hours this began to subside, and had disappeared in three days, after which he progressed steadily. On the 9th October antiseptic dressings were laid aside—the wound being healed—except in two little spots about the size of a split pea, where a drop or two of pus formed daily. He was kept in bed for a month, then allowed up with a truss, which was gradually laid aside until he went up again for examination at Sandhurst, which he did at the beginning of Dec., 1883. Surgeon-Gen. M'Kinnon carefully examined, and passed him, pronouncing the cure satisfactory, and expressing his opinion that the open or direct operation which had been performed was the right one in such cases.

Case 3.—T. B., 3 years old, was brought to the Adelaide Hospital on the 10th December, 1883. I had seen him a few days previously at my own house, where his mother had brought him for my opinion regarding a large inguinal hernia on the right side. The history of the case was to the effect that when ten months old he fell out of his mother's bed, and

shortly afterwards a swelling was noticed in his right groin, which was made worse by coughing and crying. This swelling steadily increased in size, but rapidly enlarged when the child took hooping cough. About six months ago, upon examination, an oblique inguinal hernia, reducible, and the size of an orange, was found on the right side. When the hernia was reduced, which was readily accomplished, the ring was easily felt, and admitted the tip of the index finger of the right hand. Various trusses had been tried in vain. The child frequently suffered sharp pain in the abdomen when the hernia was down. On the 11th December, I operated by the method already described, and closed the internal ring with two silver wire sutures—Listerian precautions being used, the wound being dressed with salicylic wool and carbolic gauze. The evening temperature was 101·2°, and the pulse 136, which was the highest point reached during the subsequent progress of the case. The wound did not unite by first intention, but granulated, and now, just a month from the date of the operation, the members can judge of the amount of closure which has been effected, the child being in attendance for examination.

The three cases now recorded show, in my opinion, that the direct operation for the radical cure of inguinal hernia is a safe one when due precautions are taken; further, that it is one easily performed; and finally, the failure of the first case proves to me that it is necessary in a bad case, and probably better, if not absolutely necessary, in all cases, that the wire sutures should be left in to form a permanent tie and firm barrier against the hernial protrusion. The main question as to the permanence of cure effected by this operation must be decided by time, and will be much facilitated by a full and faithful record of all cases, whatever the amount of success or failure which is attained, being given by all those who operate. This I will do, and other members doing the same, we may hope in a short time to have such a record as will decide the question as to whether we have or have not in the direct operation the true radical cure of inguinal hernia.—*Dublin Journal of Medical Science, Feb.* 1884, *p.* 105.

46.—PRACTICAL REMARKS ON STRANGULATED HERNIA.

By J. Walton Browne, M.D., Royal Hospital, Belfast.

From January 1st, 1850, until December 31st, 1882, 163 operations for strangulated hernia were performed at the Belfast Royal Hospital, with 69 deaths; which gives a mortality of a little over 42 per cent.

I seldom use the warm bath now before proceeding to taxis. In very old people, I consider it positively injurious; and cer-

tainly it can be of no service in cases of femoral hernia. In hospital practice I like a full opiate or hypodermic injection of morphia to be given; and have the patient's bladder and rectum emptied. In about an hour, the pelvis being elevated by a pillow placed underneath the buttocks, chloroform is administered, and gentle taxis tried. In children, in whom I have had three cases, I have tried elevation of the pelvis, by placing the child's limbs over the end of the cot. I once heard a distinguished London surgeon declare that he never found it necessary to operate for strangulated hernia in children; that he was always able to reduce the gut by taxis. My experience does not corroborate his statement. The taxis is not tried when the intestine has been several days strangulated, nor when it has been tried ineffectually by several medical men.

The symptoms being urgent, we proceed to operate. No doubt, the most urgent symptom is vomiting; and, although there may be no sickness so long as the patient remains quiet and keeps the stomach empty, the moment he moves or takes any nourishment the vomiting commences. I would recommend in all cases of hernia, where vomiting is the prominent symptom, that the rectum be thoroughly examined. Not long since, I had a case of strangulated femoral hernia. Upon examination of the rectum, we found a malignant stricture; and the question at once arose, Were the symptoms of strangulation due to the hernia or to the strictured rectum?

In operating, I like a long skin-incision; it gives you plenty of room, and lets you see what you are doing; and all your subsequent incisions should correspond in length to your skin-incision. When the strangulation is of several days' duration, I like to open the sac and see the contents; also when the symptoms of strangulation have been very acute from the first. Although the stricture is frequently external to the sac, yet the neck of the sac itself may form the stricture. Adventitious bands may remain inside; and, as length of time is not an absolute criterion as to the state of the contents of the sac, but rather the tightness with which the bowel has been caught, you cannot tell with certainty when to open the sac and when to leave it unopened. In all cases of femoral hernia, I would be inclined to open the sac, as it is in this form of hernia we frequently meet with omental sacs strangulating the bowel. A short time since, I had a case of femoral hernia. I did not open the sac; the protrusion was returned by taxis. The patient died. At the *post mortem* examination, I found a piece of intestine strangulated by an omental sac.

As regards the diagnosis of the contents of a hernial sac before operation, it is most difficult to decide. I have frequently seen mistakes made; and, in my opinion, it is almost impossible

to ascertain the contents of the sac before operating. In the division of the seat of stricture, in all my cases, with the exception of one, I have used the hernia-knife introduced into practice by Dr. Patterson, of the Western Infirmary, Glasgow. It differs from Sir A. Cooper's simply in the blunt-pointed part of the knife having a quarter turn given to it, so that the flattened point passes more readily under the stricture, while its breadth flattens and pushes the gut aside as the cutting part of the blade follows. I have found Dr. Patterson's knife especially valuable in operating upon cases of femoral hernia. When the stricture is tight, the point of the instrument, being wedge-shaped, is readily introduced under the stricture, doing away with the necessity of using a director. It has also been found useful in cases of inguinal hernia, when the stricture is deeply seated and a large mass of intestine down; it is in such cases that we fear wounding the gut. Here, by keeping the forefinger at the point of stricture, the intestines are pushed aside, and the knife can be slipped along the palmar surface of the forefinger, with the cutting edge looking directly upwards. I believe there is little risk of wounding the bowel. Contrast the difficulty of cutting a strictured point with Sir A. Cooper's knife, with a large mass of bowel protruding. Unless great care be taken, either in introducing or withdrawing the knife, the gut may be injured. (A hernia-knife very similar to Dr. Patterson's was introduced into practice by the late Mr. B. Wills Richardson of Dublin.)—In a few of my cases, owing to the large mass of bowel protruded, it was found difficult to reduce it by gentle taxis. I found, by enveloping the bowel in large sponges wrung out of carbolised warm water, that the bowel at once contracted or shrank up, and taxis was rendered easy. When returning the bowel, it is pleasant to feel it glide away, no force being necessary to push it back. I think it is an injurious practice to push the forefinger into the abdominal cavity after reduction. It is quite sufficient to satisfy yourself that the canal is clear. The amount of serous fluid which escapes from the abdominal cavity after division of the stricture is remarkable. In one of my cases, the flow continued for three days, and over one and a half pints flowed away. In seventeen of my cases the sac was closed by catgut sutures, as recommended by Mr. Southam of Manchester. I have much confidence in the plan, as no doubt it diminishes the risks of inflammatory changes proceeding from the superficial structures to the sac. The sac, after reduction of the bowel, has been ligatured at the neck, and cut off in four cases, with good results; and the method so highly spoken of, at our meeting last year, by Mr. Banks of Liverpool, of removal of the sac, and stitching the pillars of the ring, has been used successfully in two cases; and I quite

agree with the fourth conclusion arrived at by Mr. Banks in his paper, that "radical cure should form a necessary part of all operations for strangulated hernia."

The dressings after operation consisted of carbolised oil and lint, or carbolic acid and glycerine. Lately, I have used with excellent results boro-glyceride. In sixteen of my cases I used Listerism, and I believe with benefit to my patients. Immediately after the operation, the patient is put upon opium and ice-poultices, or ice-bags are placed over the abdomen. The opium and ice are continued so long as any tenderness upon pressure or pain in the abdomen is complained of. I have great faith in the application of ice to the abdomen, where symptoms of peritonitis threaten after operations for hernia. In a paper "On the Local Use of Cold in Abdominal Inflammations," by Dr. Eade of Norwich, he considers the *modus operandi* is to abstract heat, to benumb excited sensibility, and to contract the dilated and semi-paralysed vessels; and its especial effects have seemed to be to diminish abdominal distension, to control the volvulous writhings of the bowel, and thereby to relieve both pain and tenderness.

At the end of five days, I like to get the bowels to act, being especially anxious in elderly and fat people; as Mr. Jordan of Birmingham has shown that the cause of death after operations for hernia is frequently due to fatty change, and failure of the muscular wall of the gut. Mr. Jordan shows that, upon *post mortem* examination of some of his fatal cases of hernia, the intestinal wall was singularly and uniformly yellow, and everywhere enormously distended; and the muscular wall, when microscopically examined, was seen to have undergone fatty degeneration.—*Brit. Med. Journal, Nov.* 10, 1883, *p.* 912.

47.—ON RESECTION OF PORTIONS OF INTESTINE.

By Frederick Treves, F.R.C.S., Assistant Surgeon and Senior Demonstrator of Anatomy, London Hospital.

From an examination of the cases already published, it would appear that this operation is not only justifiable, but that in selected and proper instances it is the best and perhaps the only means of affording substantial relief or reliable cure. Resection has now been practised upon all parts of the intestinal canal from the pylorus to the rectum, but I will confine my remarks to the principal difficulties and risks of the operation, and endeavour to point out how those difficulties may be met. A careful examination of the recorded cases of resection, and especially of the fatal cases, reveals one very striking fact, and that is that the failure of the operation is more often due to defects in technical details than to any other cause. The future

of the operation, and the probability of its being established as a proper and sound surgical procedure, depend more upon improvement in the details of the operation itself than upon a more elaborate knowledge of the circumstances under which it should be performed. I will consider first resection of the small gut, and subsequently resection of the colon, omitting altogether the operations for pyloric cancer and for artificial anus.

In resecting portions of the small intestine the abdomen is opened in the middle line below the umbilicus. When the peritoneum has been divided, and the diseased part is being searched for, some protrusion of the distended gut is very usual. It is most desirable that this protrusion should be prevented. With care the intestines can be retained by the application of large carbolised sponges, and by puncturing the distended bowel in several places with a capillary trochar. This pricking I have practised without ill result in three cases of laparotomy for intestinal obstruction. When the diseased part has been dragged out of the wound, it becomes necessary to control the gut above and below to prevent extravasation of fæces when the resection is performed. This control of the bowel has been effected in many ways. By some it is advised that a partial union of the bowel should be effected before the preparations for an intestinal fistula are made. Of the other methods available there are Jobert's invagination process, which consists of invaginating the upper into the lower end of the completely divided intestine and then stitching together the serous surfaces, and Maisonneuve's plan of "intestinal anastomosis," where the divided small gut above the obstruction is joined to some part of the colon. Neither of these processes, however, would appear to have been applied to the human subject. There remains the method of directly uniting the two ends by suture, returning them into the abdomen and closing the parietal wound. The difficulties in the way of this last and perhaps most desirable method are numerous. The two ends of the gut have to be kept in accurate apposition while the sutures are being inserted. The corresponding parts of the two portions of the bowel must be precisely approximated. Any sudden movement of the parts may cause the sutures already inserted to tear out, and the relation of the divided ends to be disturbed. Moreover the intestine operated upon is lax, flabby, collapsed, and empty, and the accurate adjustment of sutures to such a structure is a matter of considerable difficulty. A still further obstacle is found in the fact that the gut above the occlusion is usually much dilated, while that below it is narrow and shrunken. The two cut ends under these circumstances are so disproportionate in size that the union of the two by suture becomes a problem somewhat difficult to solve.

From what has been said it will be seen that the following circumstances may contribute to a failure of the operation. The bowels may be unduly exposed and handled during the operation. The gut may be damaged by the clamps or ligatures applied to prevent extravasation of its contents. The difficulty of introducing the proper number of sutures may render the operation of long duration, and on this account it has on more than one occasion occupied over two hours. Fæcal extravasation may occur after the united gut has been returned, owing to the improper manner in which the stitches have been applied, or to their insufficient number. In one instance (Baum's case of resection of part of the ascending colon) only six sutures were applied, with the result of fæcal matter escaping soon after the operation was completed. When one remembers that in cases of resection of the pylorus from forty to sixty separate stitches are not considered too many, it will be obvious that six sutures applied to the colon will be almost as useless as one. In several cases the fatal issue appears to have been due to a kinking or abrupt angular bending of the gut at the seat of the resection. This result can, I think, be avoided by taking care that the gut at the seat of the operation is well occupied by intestinal contents before it is returned into the abdomen. If moderately distended the gut has little opportunity for bending, while the distension serves to test the security of the stitches. In the second place, a proper treatment of the mesentery may help to prevent occlusion at the suture line. The mesentery attached to the piece to be resected should not be divided in a straight line close to its attached border as has been usually done. The better plan is to remove a triangular piece, the base of the triangle corresponding to the portion of bowel to be removed. The edges of the gap thus formed in the mesentery should then be carefully approximated by a few points of suture, and care should be taken to remove no more of the membrane than that corresponding to the segment of gut to be excised.

In two or three cases, from want of proper clamping, fæcal extravasation occurred from rupture of the gut during the necessary handling of the part, and a fatal issue was thus at once rendered almost inevitable. I have been unable to find any case of stricture of the gut following the direct suturing of the intestine after resection. In Rembard's case a piece of the suture used was found in a stool twelve days after the operation. It would appear that the sutures are soon covered over with lymph, and in a case reported by Berger this protection is said to have occurred eight hours after the operation. That the integrity of the gut can be fully established after resection followed by suturing of the divided ends is, I imagine, proved by

the cases of pyloric resection where the test is as severe as it can be. In nine experiments made upon animals by Madelung perfect union of the divided bowel occurred after the resection of a segment of the intestine.

As the operation of resection, however, at present stands, it must be confessed that the best results have been obtained in those cases where the excision has been followed by the formation of an artificial anus; and, on the other hand, little encouragement has been offered for the performance of direct apposition of the divided ends and the replacement of the bowel within the abdomen. This latter procedure has failed from gross faults in the details of the operation, and if those faults be remedied I see no reason why this method should not surpass in its completeness and in the certainty of its results the plan that involves the formation of a temporary or permanent intestinal fistula.

In regard to resection of the colon the above remarks will, with some modifications, fully apply. The great difficulty in resection operations performed on the large intestines lies in the situation of the abdominal incision. When a distinct tumour exists and when the precise locality of the disease is obvious, it may be the best practice to cut down upon the mass in one or other loin, making use of one of the incisions for lumbar colotomy. When, however, it is impossible to diagnose the site of the disease with absolute certainty, there appears to be no alternative but to make an exploratory incision in the middle line. This has been done in two cases (Gussenbauer's and Marshall's), while in a third case (Baum's) the incision was made two inches and a half to the right of the middle line. In Baum's case the disease was in the ascending colon, in the two other cases in the descending. In each of the three instances it was found impossible to remove the mass through the median incision. In Marshall's case, therefore, a second wound was made in the loin, and in the other cases a free incision was carried transversely to the loin from the original wound. It is significant that these three cases are those that were fatal out of the seven recorded cases of colectomy, although the gut was in each instance removed finally from the lumbar region as in the non-fatal instances.

There are many points in favour of resecting the colon from a median incision, and this applies even to cases where a mass is obvious. That it can be easily done, if proper appliances are used, is, I think, demonstrated by a case in which I resected without difficulty a portion of the descending colon through a wound in the middle line. In the lumbar incision the space is limited and it has been found difficult to fully expose a large mass in that locality. In one case (Martini's) it was found to

be impossible to reunite the colon after the resection, and thus a permanent artificial anus was inevitable. This difficulty would not have been encountered had the bowel been approached from the middle line. Of course if it is intended that an artificial anus shall be formed after the resection, the loin is the proper spot to select for the operation. But if it is intended to resect the bowel and then to unite the divided ends by suture, I am strongly of opinion that the median incision is the best. In the discussion that followed upon Mr. Bryant's paper in March last, I find it reported that two surgeons, Mr. Howard Marsh and Mr. Harrison Cripps, were inclined to advise if not a median incision at least a vertical incision at the outer edge of the rectus. They contended, with I think considerable justness, that the incision in the loin did not afford sufficient room for other than very limited operations.

New Appliance for Resection of Intestine.—I will now draw attention to an appliance I have had made that will, I hope, meet many of the difficulties incident to resection. The apparatus consists in the first place of two clamps to secure the gut above and below the site of resection. Each clamp is made of two separate and light metal bars, provided with an india-rubber pad on the surfaces that are in contact with the gut. The clamp is two inches and a half in length, and one part being placed beneath the gut and the other upon it, the two are then approximated by screws placed at each end. By this means the gut can be evenly and accurately compressed with as much or as little force as may be thought fit. I find that a clamp of the size exhibited is equally suitable to the small gut of a child and the distended colon of an adult. I first apply a clamp to the gut one inch and a half below the proposed resection line, and then having emptied the part to be excised by squeezing its contents upwards, I apply the second clamp at a similar distance beyond the upper resection line. Thus in most cases an empty condition of the part to be removed can be insured. A triangular piece of the mesentery should then be excised, the base of the triangle exactly corresponding to the part of gut to be removed. All its divided vessels having been secured the diseased gut can be at once resected. I now unite the corresponding ends of the two clamps by means of long narrow steel rods secured to the extremities of each clamp by a small screw. By means of these bars the two clamps can be evenly approximated and the divided ends of the gut brought into the most accurate contact.

When all the screws are secured the bowel to be united by ligature is held in a rigid frame, so that it can be turned over or moved in any direction without disturbing the contact of the two divided ends. By this means the sutures can be as readily

applied to the sides and under surface of the bowel as to its upper or more exposed surface. The frame does not require to be held and any risk from the slipping of the divided intestine is quite avoided. The sutures may then be introduced. Now, although the frame maintains the bowel ends in accurate and stable position, yet those portions of gut, being limp and collapsed, are therefore not easily united. What appeared to me to be required was some solid tube or support that could be introduced at an equal distance into the two ends of the bowel and over which the sutures could be applied. For this purpose I devised a tube of fine gelatin about one inch in length, proposing to insert equal portions of it into the two bowel ends and suture the parts over it as over a substantial support. I imagined that the gelatin tube would after the operation prevent kinking of the gut, would lessen the risk of extravasation of the contents and would keep the tube patent. Moreover, it would possibly not be dissolved until the sutures had been rendered somewhat more secure by lymph. But to be of any use these tubes would have to be kept in a multitude of sizes, and moreover they would hardly be of any use under those common circumstances where a distended bowel above an obstruction has to be united to a shrunken bowel below it. Discarding these tubes I had a very thin india-rubber bag made about three inches in length, of sausage shape, and that could be distended by air to a large size through a tube inserted about the middle of its long axis. Having blown out this bag till it was about the side of the divided bowel, I inserted one end into the lower piece of the intestine, and the other end into the upper piece. The tube that supplied it with air would thus occupy the suture line. After being inserted the bag can be distended to any size, and can thus quite overcome any inequalities in calibre that may exist between the two pieces of bowel. It moreover forms a firm support in the interior of the gut over which the sutures can be most readily applied. If the distension of the bag disturbs the mutual relations of the divided ends, this can be rectified by a slight readjustment of the clamp. The sutures are then applied all round the gut and almost close up to the interruption in the suture line caused by the tube that fills the bag. The sutures having been applied, the bag is exhausted of air and is withdrawn from the bowel, and so thin is its structure that the collapsed bag can be drawn through a hole with the circumference of a No. 13 catheter. It only remains, then, to close the little opening left after the removal of the bag. If the stitches are properly applied, there should not be the least risk of pricking the bag, for the sutures should not include the mucous membrane. Of the various forms of suture, viz. Gely's, Czerny's, Güssenbauer's, and Lembert's, I think

that the last named is to be preferred as it is the most easy to introduce, and in this operation I imagine that time is a matter of great moment. At least from thirteen to twenty points of suture should be employed. Madelung advises that they should not be more than three millimètres apart. The best material for the stitch is, I believe, the finest "Chinese twist," and in using Lembert's suture I have found a small curved needle used with a needle holder the most convenient. Before the gut is replaced in the abdomen and the wound in the parietes closed, it is necessary that the two cut edges of the mesentery be united by a few points of suture.—*Medico-Chirurgical Transactions, vol.* 66, 1883, *p.* 55.

ORGANS OF URINE AND GENERATION.

48.—RISKS ATTENDING CATHETERISATION IN CASES OF LONG-STANDING RETENTION OF URINE.

By Sir Henry Thompson, Bart., F.R.C.S., &c.

The risk sometimes incurred by elderly men in commencing the use of the catheter, accurately appreciated by Sir A. Clark (Art. 25, p. 213), is a subject of great importance. It is, however, by no means unrecognised by surgeons, and has long been one of much interest to myself; so that I have made it a special topic for remark and caution. I have so often observed the danger in certain cases associated with a resort to catheterism, although rendered absolutely necessary to relieve chronic retention of urine, that I have advised the greatest care and special management for them. But the dangerous and fatal results are rare as compared with the great number of elderly men who are compelled to depend for relief on the catheter, and who derive the greatest advantage and comfort from its daily use. For a case never becomes advanced and dangerous in regard of retained urine, unless the retention has been long overlooked or neglected, and when advice to empty the bladder in an early stage has unhappily not been given. If employed at that early stage, before the urinary organs have suffered damage from retention persisting perhaps through many months or even years, no fatal or dangerous "fever" will be met with. It is the *neglect of timely catheterism*, and not the employment of a catheter, which is the real occasion of the fatal issue, which now and then occurs under the circumstances described. The first surgeon to point out the occurrence of this particular form of "fever" was Sir B. Brodie, and I beg you will allow me to cite an extract from the 7th edition of my Clinical Lectures, referring to his views, describing the symptoms, and indicating the method which I

have adopted to diminish the risks which should mostly be expected, and always be provided for, when a pint or more of urine habitually remains in the bladder, despite the patient's efforts to relieve himself. The passage is as follows:—"I revert to a fact, already alluded to, which is one of considerable importance, that although the urine may have been quite clear before the catheter was employed, yet in some instances, after its habitual use has been continued for a short period, the secretion becomes cloudy, and the patient is feverish and unwell. A stage of constitutional derangement, more or less marked, has sometimes to be passed by those persons who, having long experienced difficulty, suddenly change from their usual mode of micturition to the artificial one. It requires some judgment, as I have already pointed out, to decide when this change should be made, but having made it the phenomena described occur in a few exceptional instances; and this fact you should be aware of, and you should watch the result of the daily catheterism. Sir Benjamin Brodie was the first to remark it, and in his valuable lectures called attention to the circumstance that patients might even sometimes gradually succumb with symptoms of low or irritative fever a few weeks after beginning to use the catheter. Bearing this in mind, our mode of proceeding may be advantageously modified in relation to those patients whose amount of residual urine is large. It is then undesirable to empty the bladder completely on every occasion of catheterism during the first few days. If the patient has been in the habit of retaining perhaps a pint of urine, or even more, after he has made water, it is a serious change for the bladder to be suddenly and completely emptied two or three times a day; the organ soon becomes irritable, the urine is charged with pus, and the patient loses appetite, becomes feverish, and there is sometimes considerable danger to life. The rule under such circumstances is to proceed cautiously. Instead of removing the entire quantity, leave some urine behind; and thus a compromise is made between the exigencies arising in this condition of the bladder, and the usually absolute rule that it should be emptied. Draw off half or only two-thirds of a pint; you will thus relieve the organ partially, and in the course of a week or sooner you may gradually accomplish the entire emptying of the bladder, and all will probably go well. And it conduces greatly to success to permit no out-door movement to such a patient, but confine him to his room, in a warm temperature, if the weather be cold, or even to his bed for a few days. The probationary period, while the use of the catheter has to be learned, and the onset of chronic cystitis with constitutional disturbance is to be feared, is more

safely passed *if absolute rest and quiet* are accepted as necessary conditions by the patient. It is only within the last few years that I have pursued this course, and I cannot speak too highly of the results. Nevertheless, very rarely, notwithstanding every precaution, you will find a case in which during this process the tongue grows slowly more red, dry, and contracted; the powers of life gradually fail, the senses become impaired, and the patient sinks. You will always find in such cases, if an autopsy is made, old-standing pyelitis, with dilatation and marked degeneration of the renal structure, and you will know that in no circumstances could the patient have long survived." (p. 57.)

The lesson to be learned—and it is an important one—is this. When the bladder of an elderly man fails to empty itself, let him learn to use a soft catheter without much delay: thus life with comfort may often be maintained to its natural term. Neglect the catheter until chronic disease of the organs is established, and a catastrophe may then be hastened by the use of the instrument. Scores of men whom I know in this town, between sixty and eighty years of age, still active, mature in mind, and more than ever serviceable to their fellows, owe their existence entirely to habitual catheterism.—*Lancet, Oct.* 27, 1883, *p.* 746.

49.—ON LITHOTRITY AT A SINGLE SITTING, WHEN LONG-STANDING ORGANIC STRICTURE IS PRESENT.

By G. Buckston Browne, M.R.C.S.Eng., London.

One of the ultimate consequences of long-standing unrelieved organic stricture of the urethra is atony of the bladder, and atony of the bladder not unfrequently leads to the formation of phosphatic vesical calculus. This result as a rule is not attained until the person so afflicted has considerably advanced in life, and when he seeks advice the surgeon has to deal with a patient suffering from a stone in his bladder, possibly of considerable size, with chronically retained and very foul urine, and with a strictured urethra. Probably the patient's sufferings have been very great, and he is so thoroughly exhausted that unless relieved his end cannot be far distant; thus it becomes a question of the utmost nicety and importance to determine the best method of treatment. During this year I have met with two such cases, and as the means I adopted have in both been followed by excellent results, I am tempted to make them public. In both lithotomy seemed to offer very little chance of success, owing to the great debility of the patients, and I determined to practise rapid lithotrity—that is to say, lithotrity with complete evacuation of the bladder at one operation—and to avoid the

use of any cutting instrument if possible. I might certainly have performed internal urethrotomy before crushing and evacuating the stone, and I was prepared to do so, had I been obliged; but in my opinion it would have so much increased the risk that I was glad to find in each case at the time of operation I could do without it. A wound in the urethra is, under the most favourable circumstances, an important one, and it may become serious if instruments get entangled in it, or if the débris of a crushed stone get pressed into it during a sitting of lithotrity. In the performance of lithotrity Sir Henry Thompson has made it an excellent rule to commence the operation by passing a bougie or two, to ascertain if the urethra is sufficiently patent, and to prepare it for the lithotrite and evacuating tubes. In the cases I am about to relate I have simply pushed this method further, and have rapidly dilated the strictured urethra, the patient being under the influence of an anæsthetic, by passing a series of conical highly polished steel sounds (*not plated*). These sounds or dilators are shown in Sir Henry Thompson's "Diseases of the Urinary Organs," (seventh edition, p. 25). The set I have are eight in number, made and polished specially for me by Messrs. Weiss and Son. Each is one size larger than the preceding one, and the point of each is two sizes smaller than its shaft. The largest measures 14 (English) at the point, and 16 in the shaft.

Case 1.—Dr. R. P. T. ——, aged sixty-four, a Lincolnshire medical man, was sent to me by a distinguished London surgeon, who had already detected calculus. The patient had had stricture for forty years, and for twelve years had had much bladder trouble; latterly his sufferings had become so severe that he sold his practice at a sacrifice, and came to London, as he feared, to die. On examination, I found a stricture at four inches and a half, which admitted No. 5 (English) closely; and after he had passed all the urine he could naturally, a catheter drew off six ounces of chronically retained urine. The stone in his bladder was of medium size. He was much reduced by constant pain, and had acquired the habit of daily taking laudanum. On Jan. 4th a No. 5 (English) catheter was tied into the urethra; in two days it was changed for a No. 8, which was worn without trouble for six days. On the 13th, at 4 p.m., Mr. Chas. Moss administered ether, and my friend Mr. John Morgan, surgeon to Charing-cross Hospital, was present and assisted me. The inlying catheter was removed, and a series of conical steel dilators were rapidly passed and withdrawn, up to No. 14 (English). Even then an ordinary lithotrite (No. 11) would not pass, owing to its blunt broad beak. A child's lithotrite (No. 8) was then introduced, and with this the stone, which was the size of a walnut, was seized and crushed, great

care being taken that no débris remained between the blades of the lithotrite and the instrument removed. A No. 12 (English) tube was introduced with difficulty owing to its bluntness, and an unmodified Clover's aspirating bottle attached. On attempting to withdraw this tube it was found impossible to bring it through the stricture, owing to a large fragment being engaged in the eye; the tube was returned into the bladder, a stylet was passed, the fragment pushed out, and the tube withdrawn, the piece of stone being afterwards crushed and washed out. The operation was a difficult one, and occupied nearly an hour, and every particle of stone was removed. The calculus consisted of a uric-acid nucleus, with phosphatic deposit round it. The fragments weighed over two drachms. A catheter was tied in. 10 p.m.; A rigor.—Jan. 14th: Has had a good night; all well.—18th: Removed the inlying catheter, and taught him to pass a coudée catheter.—20th: All pain gone. Takes only fifteen minims of laudanum daily, and this is simply the result of habit. The retained water is six ounces. He goes seven hours after passing his catheter before he has to pass water. This patient has enjoyed excellent health and complete comfort ever since. His stricture admits No. 10. He empties his bladder twice daily by catheter. He sleeps the night through without disturbance, and can ride in omnibuses and cabs without inconvenience. In March his health was so good that he bitterly regretted having abandoned his practice in the country, and, as he could not remain idle, he has begun again, and is now actively carrying on his profession in the north of London.

Case 2.—Capt. J. C. P.——, aged fifty-nine, a master mariner, brought to me by Dr. John M. Crombie, of Oakley-square. The patient has had stricture of the urethra for twenty years, for twelve months he has had much pain, and he is now suffering dreadfully from constant agonising calls to pass water. He is much exhausted and very weak. The meatus is contracted. there is stricture at five inches, which with difficulty admits No. 6 (English), and on sounding him the bladder was found contracted upon a large rough stone. The patient is in too miserable a state to permit of any preliminary tying in of a catheter. On Aug. 22nd, 3 p.m., Mr. Charles Moss gave ether, and Dr. John M. Crombie was present. The meatus was divided with a bistourie cachée, and the deep stricture rapidly dilated by the conical steel sounds up to No. 16 (English). A very large phosphatic stone was crushed, and the fragments entirely evacuated, through a No. 14 tube, in fifty minutes. The lithotrite was so tightly grasped by the stricture, that towards the close much difficulty was experienced in feeling the fragments. The calculus was purely phosphatic, and the débris weighed over an ounce. A catheter was tied in. 11 p.m.: Slight dis-

comfort. A morphia draught was given.—Aug. 23rd: The catheter removed.—24th: Pulse 100. Very little pain. Urine contains mucus.—Sept. 1st: Sounded; nothing to be found. Passes water every four hours. No pain. Urine clearer. The bladder does not empty itself by one and a half ounces.—5th: Went home well. Has learned to pass a catheter every night, in order to empty the bladder and to wash it out.—Oct. 26th: Called to say he was perfectly well. Holds his urine five to six hours in the day, and is not disturbed during the night to micturate. He is free from all pain. Has made arrangements to go to sea again.

Such cases are very encouraging. I am satisfied that the second one would have succumbed under any cutting operation, and certainly the first would have been exposed to infinitely greater peril if lithotomy had been practised. In both cases the utmost care was taken to thoroughly evacuate the bladder of stone, and the results redound to the credit of modern lithotrity at a single sitting.

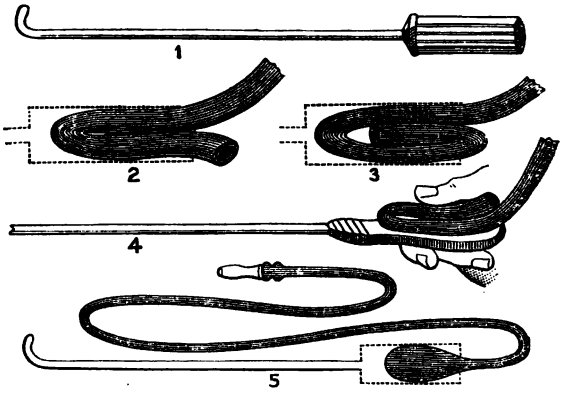
The practical points to be attended to in attempting the removal of vesical calculus by lithotrity in the presence of organic stricture appear to me to be:—1. Not to attempt such an operation if there is any false passage, or if the surgeon has not perfect confidence in his power to readily pass instruments in the particular case before him. 2. To use a lithotrite the blades of which cannot become so separated by débris as not to be approximated before withdrawal. 3. To thoroughly break the stone into small pieces, leaving no large ones, before commencing evacuation. 4. To evacuate only with tubes provided with stylets, so that if a fragment becomes engaged in the eye of the instrument it can quickly be dislodged.—*Lancet, Nov.* 10, 1883, *p.* 810.

50.—THE LITHOPHONE—FOR DETECTION OF CALCULI.

By James McKenzie Davidson, M.B., C.M., Assistant to the Professor of Surgery, University of Aberdeen.

In July 1882, in a short article on "A New Mode of Detecting Stone in the Bladder—the Auditory Method" (*Retrospect*, vol. 86, p. 232), I stated that vibrations produced in a sound by its contact with a calculus were readily conveyed to the ear by means of an indiarubber tube, one end of which was attached to the handle of the sound, while the other was held to the ear, the ordinary bladder-sound being converted by this means into a kind of stethoscope. Direct experiment on the dead subject proved that the larger the bore of the tubing employed the better were the results. The largest bore of tubing thus used was 3-8ths of an inch in diameter, which gave the greatest

intensity. But the weight of a tube of that size was an obstacle to the delicacy of touch. This difficulty has been overcome, however, by attaching smaller and lighter tubing in a manner to be described, which gives equal intensity, but without the drawbacks of the larger and heavier tubing. I had always fastened the tubing, slipping it over the handle of the sound if the tubing had a bore large enough, but if the tubing had a small bore it was slipped on to a little projection from the handle made for the purpose. But the method of attachment that carries the greatest intensity of sound is as follows: — A piece of indiarubber tubing about twenty-six to thirty inches long, with a small bore (3-16ths to 1-8th of an inch in diameter), is employed. About an inch from one of its ends it is folded on itself, and this part is then held tightly against the handle of the sound, as shown



Reduced one-fourth.

in Fig. 4, care being taken that the long part of the tube that goes to the ear lies next the handle. It can be retained in position by a small clamp, instead of being held by the fingers. By this simple means greater intensity of sound is conveyed than by a tube of much larger bore, attached by merely slipping it over the handle. It is probable that the intensity thus attained is due to the part of the tubing pressed against the handle of the sound acting as a "drum." And by means of it the vibrations get transferred from the sound with little loss to the column of air within the tubing and thence, of course, directly to the membrana tympani. To carry out this plan of fastening the tubing in a convenient manner I con-

structed a sound with a hollow cylindrical handle, open at the end like the mouth of a gun (see Fig. 1). The stem is of solid steel and nickel-plated, and does not differ from the short-beaked sounds now in use. The handle is two inches and a quarter long, and hollow, with a diameter of half an inch. Externally it has roughened longitudinal ridges, for convenience in manipulation. A smooth band along the anterior part indicates the position of the beak of the sound. This instrument can be used either as an ordinary sound or, when desired, tubing can be readily attached. A piece of small and light india-rubber tubing, about thirty inches long, is bent at one end, as before described, and the loop so formed is thrust into the tubular handle, as shown in Fig. 2. The other end, fitted with an ivory or bone earpiece (such as is used with the otoscope), is put into the ear, where it should remain fixed without requiring to be held. If the tubing be of very small bore, then its end may have to be folded or coiled, as shown in Fig. 3, in order that it may fit tightly into the hollow handle of the sound. It is always necessary that the part of the tubing that leaves the sound to go to the ear should be tightly pressed against the handle of the sound. A binaural arrangement can be easily made by taking a piece of tubing double the length (about four feet and a half or five feet long), folding this in the middle, and thrusting the loop at the bend into the tubular handle of the sound. The two free ends, armed as before with earpieces, are placed one in each ear. The note is thus intensified greatly, but for all practical purposes the single tube is quite enough. However, with the binaural two persons can listen at the same time, and so verify the diagnosis with greater exactness. A convenient form of lithophone is shown in Fig. 5. The same sound is employed as shown in Fig. 1, but instead of a simple indiarubber tube one with a ball at one end is used. The bulb is egg-shaped, and barely exceeds half an inch in diameter at its widest part. It can be readily squeezed into the tubular handle, by folding the ball longitudinally and so introducing it into the handle, where it becomes tightly fixed by its own expansion. The other end is fitted with an earpiece. This instrument gives good results. The lithophone does not hamper the delicacy of touch in exploring the bladder. The tubing is light, and is attached in a manner which allows great freedom of movement. The exploration of the bladder is carried on by a combination of the senses of touch and hearing. A particle of sand weighing less than 1/500th part of a grain lying on cotton-wool was detected by hearing its contact with the lithophone. It could not be detected by touch alone when the tubing was detached. Of course this extreme delicacy is not required in the bladder,

but it serves to show the sensitiveness of this auditory method. In ordinary cases a common sound will do quite well, but in difficult and obscure cases there can be no harm in bringing an additional sense to our aid. It remains a fact that calculi are occasionally not detected even by skilled hands. And it is more than likely that the lithophone will prevent the general practitioner sending so many doubtful cases of stone to the specialist. The former, who sees as many cases of stone in a year as the specialist in a day, cannot be expected to possess the *tactus eruditus* to the same degree. But with very little experience he will soon learn to detect the unmistakable sound produced by the contact of the lithophone with a calculus, or with even a small fragment.

It appears that the idea was first suggested in the Irish Hospital Gazette, 1873, a fact entirely unknown to me at the time I wrote.—*Lancet, Nov.* 3, 1883, *p.* 770.

51.—FISTULÆ IN PENILE PORTION OF THE URETHRA SUCCESSFULLY TREATED BY PLASTIC OPERATION, AFTER OPENING THE URETHRA IN THE PERINEUM.

By H. H. Clutton, M.A., M.B., F.R.C.S.Eng., Assistant-Surgeon to St. Thomas's Hospital.

Fistulæ in front of the scrotum, involving as they often do a considerable loss of the floor of the urethra, present exceptional difficulties to the surgeon who attempts to close them. The innumerable plastic operations that have been planned and executed, stand as witnesses in our surgical literature to this difficulty. This must be my apology for bringing before the Medical Society of London a solitary case such as the one I am about to record. Urethroplasty, with endless variety of flap and suture, has perplexed the surgical mind from the commencement of this century, whilst in most of the cases recorded you hear little about the method of dealing with the urine. Yet this undoubtedly forms the chief obstacle to success.

Sir Henry Thompson in his classical work on stricture of the urethra has strongly insisted on the uselessness of tying a catheter into the bladder for the cure of fistulæ in the penile portion of the urethra. And there are few surgeons who have not seen the urine falling by the side of the instrument where the catheter has been used in this way. Useful as this treatment is for the simple dilatation of a stricture, it cannot be of much service in keeping out the urine from the wound after a plastic operation on the urethra. The only other plan at all suitable besides the one that I am now about to advocate is that of passing a soft instrument down the urethra into the bladder every time the patient wants to micturate. This has undoubt-

edly been attended with greater success than the preceding plan, and the same author has most graphically recorded an interesting case of this kind, where the patient was taught to pass the catheter for himself during the treatment, and the result was a most brilliant success. But there are many disadvantages, not the least of which is the difficulty of having this method thoroughly carried out. You are dependent in a great measure upon the good sense of your patient, upon the sensitiveness of his urethra, and the total absence of cystitis. On the other hand, if the urethra is opened behind the scrotum, and a catheter kept constantly in the bladder through this opening, all these difficulties are obviated. The urine flows away without any pain or discomfort to the patient, and a certain amount of cystitis is not incompatible with success. The operation is a very trifling one, as the membranous portion of the urethra is alone incised, and a catheter introduced into the bladder through this opening cannot be attended with greater risk than when it is lying in the whole length of the urethra. In addition to all this there is one great advantage. There is no risk of urethritis in that part of the canal in which you wish to perform the plastic operation. The urethra in front of the scrotum is left entirely free from urine, and there is no constant source of irritation and consequent inflammatory exudation, such as naturally follows upon tying a catheter into the whole length of the urethra, or even such as must in some cases result from passing a catheter as often as may be necessary to relieve the bladder. Constant catheterism must disturb the parts which you are striving to heal, and in some patients would infallibly produce a copious purulent secretion. Again, if there be a certain amount of cystitis, the patient is by no means in a worse condition with a "vent-peg" in his perineum. If cystitis be present before the operation, he will probably be relieved; if set up in an irritable subject by the operative manipulation, little though it be, it very soon subsides, and one may have, I think, the consolation of believing that he never would have stood the constant catheterism which is the only other alternative.

My patient, whose age was nineteen, was brought to me by Dr. Stone of Reigate in the spring of last year. He had two large apertures in his urethra in front of the scrotum, and gave the following account of himself before he came under the care of Dr. Stone. Eight months previously he had had a very sharp attack of gonorrhœa, never having had it before. This was followed by cystitis, and the doctor at that time attending him tied a catheter into his bladder. Two large abscesses formed almost immediately after its removal, one just in front of the scrotum and the other just behind the glans penis. In consequence of this he put himself under the care of Dr. Stone.

The fistulæ following these two abscesses continued to secrete a large quantity of pus, and treatment continued for some months appeared to have little or no effect upon the discharge. He was also in wretched health. Under these circumstances we decided to send our patient to Australia for the voyage. He returned in six months in capital condition, with mucous discharge from the fistulæ instead of pus, and suffering only from the annoyance and inconvenience of too many outlets for his urine. The discomfort, however, was a very serious one; as much water ran out of the fistulæ as out of the meatus, and he was obliged to take down his trousers when he wished to empty his bladder. He had also a very copious mucous discharge, requiring the constant application of an abundant dressing. On passing a full-sized metallic bougie, the urethra was found to be of its normal calibre, but the instrument could be seen and felt with a probe in the two places before mentioned. The floor of the urethra was destroyed for about a quarter of an inch in the anterior fistula and for fully three-quarters of an inch in the posterior, and the latter also communicated with a mucous secreting cavity in the scrotum. Considering the extensive nature of these lesions and the irritable condition of his urethra, which had been abundantly proved during the previous treatment, we determined to establish an opening in the urethra behind the scrotum before attempting a plastic operation on the fistulæ.

On October 19th he was placed under the influence of an anæsthetic whilst an opening was made into the urethra in the perineum. Through this an elastic winged catheter was placed in the bladder, and by means of indiarubber tubing the urine was conducted into a vessel beneath the bed. We determined that the plastic operation on the penile fistulæ should not be done till the preliminary opening in the perineum had been firmly established, and the patient had become accustomed to this condition. For some days he suffered constantly from spasm, with pus, blood, and mucus in his urine. The idea struck Dr. Stone that this was in a great measure due to the column of urine in the tube hanging over the bed. He believed that this drew the mucous membrane of the bladder into the eyes of the catheter and irritated its walls. The tubing was therefore removed, and a small vessel placed in the bed at the end of the catheter. After this change our patient had much less pain and discomfort, and his symptoms of cystitis abated. On Nov. 3rd, a fortnight after the preliminary opening in the perineum, he was again placed under the influence of an anæsthetic, and both fistulæ closed by quilled sutures. The edges were of course thoroughly pared down to the urethra, and in the case of the posterior fistula the lining membrane of a cavity

which led from the urethra into the scrotum, and secreted a considerable amount of muco-purulent fluid, was dissected out. Silver sutures were passed down one side of the raw surface across the urethra and out on the other side without appearing in the wound. They were then attached to quills and the flaps brought together, the edges of the skin between the quills being also sutured with catgut. The method employed was therefore similar to the operation for ruptured perineum, and was of the simplest kind. There was no flap from a distance or sliding operation, but a simple straight incision down the middle brought together with two pairs of quills. It would be tedious to give all the details of the following week. Shortly it may be said that he suffered very little after the alteration of the tubing connected with the catheter, and that there was scarcely any mucus, blood, or pus after this alteration. The catheter required changing every two or three days, as it quickly became coated with phosphates. The wounds healed rapidly and soundly, and on Nov. 9th, six days after the plastic operation, all the sutures were removed. The anterior fistula was perfectly closed, but the posterior one had two tiny apertures through the new cicatricial tissue and several large suture holes. The dressing was therefore reapplied. On Nov. 16th the suture holes had healed and the cicatricial tissue in the median line was fairly firm. On the 20th, seventeen days after the plastic operation, as the fistulæ were closed and he was again suffering from some irritation of the bladder, the catheter was removed. These symptoms rapidly subsided and he began to pass water in the ordinary way. On the 24th, exactly three weeks after the plastic operation on the penile fistulæ, he was passing water through the urethra without any escaping either by the perineum or through the fistulæ. Subsequently, on moving about, a pinhole aperture was discovered in the posterior of the two penile fistulæ. This gave him no inconvenience, and produced only a little moisture after micturition. The copious discharge of mucus, which previously annoyed him, entirely ceased, and he had no gleet whatever. A full-sized bougie à boule could be easily passed down the whole length of the urethra and no contraction felt. On Dec. 20th there was still the same pinhole aperture, which was being treated by Dr. Stone with occasional applications of caustic. From this time he went about as usual, and declined further treatment, as he felt quite comfortable in every way. Six months afterwards he still had the slightest moisture after micturition from the same minute opening through the cicatrix of the posterior of the two penile fistulæ. He was, however, so happy and comfortable and found so little inconvenience from it that he decided to remain without further treatment.—*Lancet, Dec.* 8, 1883, *p.* 986.

52.—ON THE TREATMENT OF TUMOURS OF THE BLADDER BY OPERATION.

By Sir H. THOMPSON, Surgeon-Extraordinary to the King of the Belgians; Consulting Surgeon to University College Hospital.

[At a recent meeting of the Royal Medical and Chirurgical Society, Sir H. Thompson presented a brief account of seven cases of tumour of the bladder which he had operated on since the reading of his previous paper in January 1883, when the histories of four other cases were given. Further, it may be remembered that in the preceding year he showed a patient from whom he had removed a vesical tumour more than two years and a half ago. A group of 12 cases is thus formed (10 in the male and 2 in the female) in all of which an operation has been performed for the removal of the growth, furnishing data which may be useful in guiding us, to some extent, in observing and treating similar cases in future. After relating the cases, Sir Henry concluded with the following observations.]

The operation has in all cases been performed as described elsewhere (see *Retrospect*, vol. 85, p. 224, vol. 87, p. 305), and consists in opening the membranous urethra from a small median incision in the perineum, and in dilating the prostate gently and gradually with the left index finger, which when fully introduced explores the entire internal surface of the bladder, while supra-pubic pressure is made under complete anæsthesia. The way is thus made for the introduction of the forceps. Of these I have designed and employed two or three forms, and found them useful to meet varied forms of growth; and some of these are now provided with cutting edges. I may remark that while in some cases the prostate is dilatable, and admits the finger without receiving much if any injury, in others a certain degree of rupture is inevitable. This I have recognised during life, and have witnessed in two of the fatal cases; but the division of tissue thus produced is not considerable.

In estimating the results of the proceeding—which it may be stated has, in every case but the first, consisted of simple external urethrotomy of the membranous portion—it is necessary to recall the fact that unless removed by surgical operation, vesical tumour is *inevitably fatal. Every recovery is a clear gain; and a fatal issue is simply the natural termination forestalled.* In these twelve cases there have been five recoveries; and in some of these there is every reason to believe that the cure is permanent, since there is no sign of recurring symptoms. In three cases death succeeded the operation in a few days. In one it occurred in a few weeks. In the remainder, the pre-existing severe and continuous hemorrhage has been completely

checked for a period of some months, and occasional slight bleedings have reappeared. The future course of these cases will be closely watched and duly reported. Such a result I would submit is one which warrants a cautious observation of the numerous cases of hæmaturia which are to be found, and also the employment of digital exploration of the bladder, when the facts ascertained indicate that the cause of bleeding is not due to ordinary, obvious, and well-known conditions.

When an adult, either male or female, has long been the subject of unduly frequent micturition, the act mostly painful, with occasional hæmaturia, this sign increasing gradually in importance as the case advances, and furnishing evidence meantime that its source is vesical and not renal, a physical, *i.e.*, surgical examination of the organs is of course indicated. The result of this may show that no calculus is present, and that no obvious enlargement of the prostate or of the adjacent structures can be affirmed. Nothing in the history can be distinctly referred to as a cause; no clue in fact is offered, except such as may be found by repeated examination of the urine. And it is by this particular means that the most trustworthy information is to be obtained. But before describing the evidence furnished by the urine, I will refer to the facts which may be obtained by the study of these twelve cases. These facts are as follow:—

1. *Nature of the growths.*—Eight were examples of simple papilloma; more or less associated with dendritic prolongations of the villi natural to the vesical mucous membrane. When the growth consists entirely of these elongated villi, the term "villous tumour" suffices to describe them. Three consisted of growths, more or less malignant; *e.g.*, epithelioma and formation of cell-growths allied to sarcoma. These also are associated with villous development like that noted in the preceding class; and in two instances, there was deposit in the neighbouring glands. One was a product closely resembling the submucous tissues of the bladder without villous growth.

2. *In relation to duration of symptoms.*—It is evident that the course of papilloma is slow. The symptoms are recorded as occupying periods before operation, varying from three to seven years. I have known longer terms still in cases formerly observed, and left in the natural course of events to end in death, as they invariably do, if not relieved by surgical aid. But the progress of malignant growth is more rapid in the bladder, as it is elsewhere; epithelioma as usual being the slowest of production in the class; from one year to two years and a quarter are the terms presented by the examples in our table.

3. *In relation to diagnosis.*—A notable fact in the history of

papilloma and of villous growths is, that the appearance of blood in the urine is one of the earliest, if not the earliest, signs of derangement in the urinary function observed by the patient. On the other hand, in the malignant growths met with, painful and frequent micturition have long preceded the appearance of blood in the urine. The same is of course true in cases of calculus and of prostatic disease.—In all vesical tumours the patient observes, as the disease progresses, that the stream of urine contains a larger admixture of blood at the close of the act than at the beginning. It often happens that the stream may commence with pure unstained urine, and become florid towards the close; and this bright red is the usual tint, and not the brown shade common in other conditions.

The microscopic examination of urine is of great importance in relation to diagnosis. In cases of villus and papilloma, and indeed of all tumours, the microscope is of great value. After my recent experiences, I attach much greater importance to it than I formerly did. At the same time it is not difficult to be deceived by some of the products found in the urine of patients where no serious organic changes have occurred.—First let me say that the deposit from a patient's urine should be examined in a fresh state; search being especially made for shreds which are mostly passed at the end of the stream, or which may be sometimes washed out by a plain water injection through the catheter. It may be necessary to repeat this examination several times. In Case 7, I found in the urine passed at the patient's first visit to me, one of the most perfect specimens of villous growth I ever saw. A slender, club-shaped process with a complete covering of columnar epithelium, and in the centre of the stem its blood-vessels full of red corpuscles clearly seen. After this, on four consecutive days, as many examinations were repeated but absolutely without result. The first observation, however, sufficed to assure me of the presence of tumour, and I had no hesitation in operating without further evidence, and removed a considerable villous papilloma.—The appearance of long villous processes in the urine-*débris*, I take to be decisive They are in my experience never seen as normal products, or in the absence of such diseased growths in the bladder.—Another suspicious product is the appearance of a mass of adhering fusiform or spindle-shaped cells of large size; some of them lengthened out into fibres, and when seen more or less regularly in the urine of a patient, with other symptoms, should arouse grave suspicions; but these cells are not pathognomonic like the villous. Large round cells of various kinds, often young epithelium, are of course not sufficiently characteristic by themselves. Then I have met with large, soft-looking fibres with nuclei on them, as if recently developed from cells,

and believed them to be significant of growth of some kind (associated with tumour symptoms and history), have explored the bladder and found nothing! This I did in two cases, and it is worthy of remark that in both instances the patient was much benefited by the operation.

4. *The co-existence of calculus with tumour is to be noted.*—In two cases at least, there had been previous formation, in the one of an oxalate of lime calculus, and in the other of several small uric acid calculi, producing continued irritation of the bladder for some time. In both instances lithotrity had been performed recently. In a third case, that of a woman, a large calculus was found in the kidney, the symptoms of which had no doubt masked the existence of the vesical tumour; and had, before I saw her, been regarded as the cause of the hæmaturia. These facts at all events lend some support to the theory that papilloma may sometimes arise from local sources of irritation affecting a mucous membrane.

There is one important point still to be referred to, viz., what is the proportion of instances regarding tumours of the bladder generally, in which we may expect to find the physical condition of the growth such as will admit of complete removal, or almost complete removal? I permit myself to say "almost complete" removal, because I am satisfied that with non-malignant products, like papilloma for example, a complete ablation of the growth is not absolutely essential to success. I am quite certain that I have removed the greater part, but not the whole of the tumour in two cases at least, in which there has been no sign of reappearance for upwards of a year. I feel little doubt that when the chief mass of papillomatous growth has been nipped off by means of forceps in or near to the base, it is impossible to affirm that all the irregular formation has been taken away; on the contrary, it is reasonable to suppose that some portion must always have been left. I believe that cicatrisation takes place, and that by degrees this process leads to solidification of the tissues at the point at which evulsion was made. I have had in one case the unusual advantage of being able to place my finger on the very site of an evulsion performed nine months before, and I then found no reappearance of growth so far as my sense of touch enabled me to judge. In the case of malignant tumours of course no attempt would be made to remove such growths; for in no case would there be the smallest hope of being able to remove the diseased formation entire. Nor, again, were it conceivable that we could accomplish this, is there any reason to believe that advantage would accrue to the patient thereby.

I have recently made a careful examination of most of the specimens of tumour of the bladder preserved in the museums

of London, and I have found about a hundred preparations, relative to which I could determine several important questions. Of these I regard about forty as malignant, and about sixty as examples of non-malignant growth; that is, specimens of what may be considered papilloma and innocent forms of villus. Of these sixty preparations, not less than thirty-five appear to me to be removable by operation. It should be remarked that many examples are labelled "cancer" which cannot be so regarded; a large portion undoubtedly are so; several are probably epithelioma; but the allegation of malignancy must not be accepted in a great number in which it is made. It is, then, an instructive and striking fact that at least one half of the simple growths can be removed with a good prospect of success. I believe the proportion is greater than this, but I have been desirous to understate it rather than the contrary.

I shall now only add that I have performed the operation described for the purpose of ascertaining the cause of severe and long-standing symptoms when obscure, in 27 cases altogether; 21 of them occurring within the last twelve months. Among them I found 12 cases of vesical tumour, and removed it wholly or partially in 10. In 2 only I declined the attempt. I cannot therefore doubt that the prevalence of these affections is greater than it has been customary to believe it to be; and that the victims of it hitherto have, after much unavailing treatment, both surgical and medical, slowly bled to death, under the impression that the source of the hemorrhage was renal, or at all events beyond the reach of any aid from art.—*Medico-Chirurgical Transactions, vol.* 66, 1883, *p.* 349.

53.—ON THE SURGICAL TREATMENT OF TUMOURS AND OTHER OBSCURE CONDITIONS OF THE BLADDER.

By WALTER WHITEHEAD, F.R.C.S.E., F.R.S.E., Surgeon to the Manchester Royal Infirmary; and
BILTON POLLARD, M.D., B.S., F.R.C.S., Resident Surg. Officer.

Exploration of the bladder is warranted in all cases in which there is hematuria presumed to arise from the bladder, accompanied by pain and increased frequency of micturition, where no rational diagnosis can be formed by the more ordinary methods of examination. In such cases there is a reasonable probability that some new growth may be discovered. It is also called for in cases, equally inexplicable, in which hematuria is the only symptom. The beneficial result of opening the urethra under these circumstances is most strikingly shown in a case in which there had been persistent and considerable hemorrhage for three months before operation. Mr. F. Heath opened the membranous urethra and passed the finger through

the prostatic portion, but it was found impossible to reach the bladder, owing to the stoutness of the patient and enlargement of the prostate; an indiarubber tube was passed into the bladder, and the urine allowed to drain away continuously. There was a slight trace of blood in the urine on the day following, but after that the hemorrhage completely ceased. In this case the two conditions produced by the operation were: (1) some dilatation of the prostatic portion of the urethra; (2) a thoroughly empty and contracted state of the bladder. In this particular case there was some enlargement of the prostate, but it was not tender on pressure, and did not interfere with the emptying of the bladder. It seems most probable that the cause of the hemorrhage was a varicose state of the vessels at the neck of the bladder, and that the success of the treatment was owing to the subsequent constant contraction of the bladder, the result of the operation.

There are cases in which pain connected with the bladder, and altogether unaffected by medical treatment, is the only symptom complained of. In one case there was no pain at the end of the penis on passing water, but there was no stone or new growth in the bladder. As this symptom did not yield to medical treatment, the bladder was explored, but nothing was found; the patient had an attack of cystitis, from which he recovered. Three months after the operation the pain had disappeared and the patient had gained 14lb. in weight.

The operations which have been performed of late for the removal of tumours from the male bladder are:—1. Lateral cystotomy, an operation identical in detail with lateral lithotomy; this was done by Humphry, Berkeley Hill, Davies-Colley, and Kocher, and the patient recovered in three of the cases; the other was one of malignant disease. 2. Suprapubic cystotomy, by Liston and Marcacci, with recovery in the one and death in the other case. 3. A combination of these two in Billroth's notable case. 4. A combination of perineal urethrotomy and suprapubic cystotomy, in Volkmann's case, which ended fatally. 5. The more modern operation of median perineal urethrotomy by Thompson and by Whitehead, in a total of fourteen cases, with six recoveries and six deaths, whilst in one case very serious hematuria was cured, and in another the symptoms were relieved.

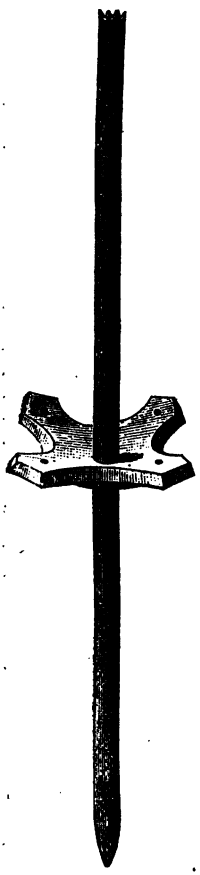
Successful cases have occurred by each method, yet there can be little doubt that median perineal urethrotomy is by far the least serious, and in fact may be looked upon as quite safe if the parts at the neck of the bladder be not torn in the manipulations required for the removal of the growths. It is very difficult to formulate a short and expressive term for the opera-

tion; it is not a cystotomy, because the bladder is not, or should not be, *cut* into. Strictly it is simply perineal urethrotomy, but undertaken with a different purpose from that usually associated with the term. It is a median perineal urethrotomy followed by some dilatation of the prostate with the forefinger.

The operation is performed as follows:—A grooved staff is passed along the urethra into the bladder, with the patient in the lithotomy position. The left forefinger is now placed in the rectum in contact with the apex of the prostate; by this means the rectum is protected and a guide for the direction of the incision obtained; the knife held in the right hand, with the cutting edge upwards, is now passed into the perineum exactly in the median line till its point lies in the groove of the staff just in front of the apex of the prostate; an opening into the urethra of just sufficient size to admit the tip of the forefinger is now made, and the external incision enlarged as the knife is withdrawn. A probe catheter is next passed along the groove in the staff into the bladder and the staff withdrawn; the forefinger well anointed with carbolic oil, or vaseline, is then insinuated into the urethra along the probe, and gradually pushed and rotated through the prostate into the bladder. With first the right and then the left forefinger in the bladder, whilst forcible suprapubic pressure is made with the other hand or by an assistant, the best possible examination of the interior of the bladder is effected. In cases complicated with stricture of the urethra this plan has to be modified. Instead of the staff, which it may be impossible to pass, a fine straight probe must be substituted and constitute the sole guide for the perineal incision. After the point of the probe has been cut down upon, it is thrust out of the wound and another director is passed backwards through the perineal opening into the bladder, and the operation completed in the usual way.

Pedunculated tumours may be removed by the forceps or écraseur, but in some cases in which this has been done it has been found necessary to use either the finger nail, or a sharp spoon, to scoop out the base of the growth. In broadly pedunculated or sessile growths removal by this means is impracticable, and in these cases the growth may be fearlessly, so far as hemorrhage is concerned, torn away or removed piecemeal by the finger and forceps, or sharp spoon, for any bleeding that might be feared under such circumstances is easily controlled by the injection of undiluted solution of perchloride of iron into the bladder. This treatment has now been frequently employed with the best results as regards the hemorrhage, and has not caused any untoward results; another proof of the power the bladder possesses of tolerating strong irritants.

After the operation we are in the habit of retaining in the bladder a soft elastic tube (see Fig.), through which it can be thoroughly washed, and through which the urine can be continuously drained away into a vessel placed beneath the bed; this tube has generally been very easily borne and retained.



In females the examination is more easily accomplished by rapidly dilating the urethra by the successive introduction of œsophageal bougies, of consecutive sizes constructed with tapering extemities, until the apex of the forefinger can be insinuated and gradually passed along into the bladder. It is interesting to note that in the only case of tumour removed in this way in which subsequent incontinence was met with, it is mentioned that the urethra was slowly dilated by a sponge tent.

In two cases Mr. A. T. Norton has removed the entire tumour, together with the portion of the base of the bladder from which it sprang. He made an incision through the urethro-vaginal septum, dissected the vagina from the bladder, and removed the growths with the scissors; the vesico-vaginal fistula, which was left, was subsequently closed by the ordinary method.

It has been considered a debatable question whether operation is advisable in malignant disease. As a means of permanent cure removal of the growth will certainly be unsuccessful, but as a palliative measure it is worthy of further trial. The danger in these cases would appear to be that of hemorrhage; but it is an unrecognised fact that the tendency to bleeding is far greater from the superficial ulcerated surface of the growths than from their base; and on this fact is founded one great argument in favour of operation in these cases, for if only a portion be removed and the base from which the growth springs left, hemorrhage is diminished. This beneficial result is unquestionably shown in three cases, one in a female and the other two in males; in these cases the growths were removed by tearing and scraping, and though the removal was not complete, it had the effect of lessening the hemorrhage, which had previously been the most serious element of danger.

The authors relate ten cases which have come under their own immediate observation, viz. :—Class 1, (*a*) Four cases in males, where a tumour was found and removed, by perineal urethrotomy; (*b*) two cases in females, by rapid dilatation of the urethra. Class 2, Four cases, where no tumour was found, but where the symptoms were relieved after perineal urethrotomy had been performed. The results were 7 recoveries and 3 deaths.]

The justification for exploration of the bladder in cases which baffle diagnosis by the more common means is obvious if we bear in mind that digital exploration has been made during the last three years in twenty-nine cases, and that a tumour capable of removal has been found in eighteen of them. The same operation also offers certain advantages in the treatment of chronic cystitis, for we secure a constant draining away of the irritating urine, and we are enabled to introduce into the bladder an unusually large double current tube, through which strong and voluminous solutions may be injected. There is a most marked difference in the tolerance of the urethra and the bladder of strong solutions of the perchloride of iron or the nitrate of silver. The feeble absorptive power of the bladder has been frequently demonstrated by Sir H. Thompson, but the great tolerance of this viscus of strong irritants has not been so much insisted upon. It is not the same with regard to the urethra; if a drop of these solutions should find its way into the urethra most excruciating pain is produced. By means of the perineal opening a good opportunity is afforded of making applications to the bladder without the fear of the solutions leaking into the bulbous and spongy portion of the urethra. As an ordinary antiseptic injection a saturated solution of boracic acid and solutions of the permanganate of potash have been found the most effectual; whilst solutions of the perchloride of mercury, peroxide of hydrogen. and of the nitrate of silver have remedial properties of great and special value in obstinate and protracted cases of cystitis.—*Lancet, Oct.* 13 *and* 20, 1883, *pp.* 629, 675.

DISEASES OF THE SKIN, ETC.

54.—ON THE EVACUATION OF DEEP ABSCESSES.

By J. F. Le Page, L.R.C.P.Edin., Manchester.

The treatment of deep abscesses, to which my remarks have reference, is not one to the origination of which I can lay claim. My intention, therefore, is to direct your notice to a particular method, in comparison with other methods; to popularise a treatment which in my own practice has been

most satisfactory; and to show to you an instrument, made for me by Messrs. Arnold and Sons, for the evacuation of these abscesses. Many years ago, Mr. Hilton urged the expediency of thrusting a director, instead of a knife, through the tissues down to the abscess, and through its walls, and then enlarging the opening with a pair of forceps. He for many years opened deep abscesses in this way at Guy's Hospital, and the practice is still continued in that institution.

The disadvantages attendant on the usual mode of opening deep abscesses may be said to be, first, the danger, even to the surgeon whose anatomical remembrances have not grown misty, of wounding, or even dividing, blood-vessels or nerves which in their course present some abnormality in direction; secondly, the tendency which the clean cut wound of a knife has to heal before the process of suppuration in the cavity is altogether ended, and the consequent risk of the reaccumulation of pus.

The advantages I claim for this method are its perfect safety, its absolute harmlessness, and its entire efficiency. Neither blood-vessels nor nerves can be wounded, nor does healing of the canal take place before the sac has ceased to suppurate. To plunge a knife through to a deep axillary abscess or a deep postpharyngeal or cervical abscess, or a deep abscess of the forearm, or leg, or thigh, or to pass it through the tissues, with all gentleness, or even with the careful cautious confidence and decision of the experienced surgeon, is to encounter a risk which has, in some cases, cost even the life of the patient; for deaths are on record which have resulted from the hemorrhage which has followed the wounding of blood-vessels in the opening of deep abscesses with the knife. For, how very readily may an artery or vein be wounded when a knife is thrust haphazard in the vicinity of a plexus of blood-vessels. Clearly manifest, then, is it that, if the dangers to which I have referred can be avoided, and the unsuccessful results incident to this treatment obviated, and that by a practice which is not only perfectly safe, but far more satisfactory in every way, the evacuation of these abscesses is best effected by that method.

The instrument I now show you was designed by me to meet the exigencies of these cases. It is six inches and a half in length, and is composed of a handle and two blades. The upper surface is grooved from within half an inch of the handle to the extremity of the upper blade, where the groove is lost, immediately before the conical point is formed. The under blade is one quarter of an inch shorter than the upper one, and does not enter into the formation of the cone. The blades are separated by turning a thumbscrew, which works in the upper

one, and which fixes them at any angle to which they may be opened. In using the instrument, it is necessary to make an incision down to and just through the fascia lata, then to thrust the conical point between or through the muscles and tissues, until the entry of the cavity is indicated by the presence of pus in the groove. The blades may then be separated by turning the thumbscrew, and the sac is in this way torn open. The evacuator is then withdrawn, with the blades diverging to any required angle; and the canal thus formed, not being a cut by a sharp instrument but a laceration, possesses the great advantage of having a tendency to keep open until the pus-cavity is healed. Re-accumulation of pus is, therefore, rendered impossible, and a re-evacuation is unnecessary. It sometimes happens that the first thrust of a knife does not puncture the abscess-wall; and a second one, with a repetition of the attendant dangers, in an altered direction, is necessary before the unseen foe can be assailed. With the evacuator, exploration may with impunity be made in different directions.

Before introducing the instrument, particles of dust should be carefully wiped off, and its surfaces should be lightly smeared with carbolic oil; for the warm albuminous liquid would favour the rapid development of the germs of putrefactive organisms. The canal should always be directed upwards to the cavity. Gentle, but uniform and sustained, pressure should be commenced immediately after producing the laceration. Healing action is very greatly promoted by this important auxiliary. The reflux of air must be carefully guarded against by covering the opening with lint soaked in carbolic oil.

The deep abscess-evacuator, when used in the way and with the precautions I have mentioned, converts a dangerous operation into one of great simplicity and of perfect safety.—*British Medical Journal, Dec.* 22, 1883, *p.* 1232.

55.—THICKENED EPIDERMIS—SALICYLIC ACID PLASTER.

By GEORGE THIN, M.D., London.

At the Clinical Society of London Dr. Thin read a paper on cases of Thickened Epidermis treated by a Salicylic Guttapercha Plaster, manufactured by Herr Beiersdorf, of Hamburg, at the suggestion of Dr. Unna, who has introduced it into practice. The first case which he related was that of a man, in whom a tendency to extreme tylosis of the soles and palms was hereditary. The man's palms and soles were covered with an extremely thick and hard epidermis, and had been for many years in this condition, the affection having resisted very varied methods of treatment. The treatment by the plaster was in

the first instance recommended by Dr. Unna, and the author simply continued it. Under the use of the salicylic plaster, which was kept constantly applied by means of bandages, and changed every third or fourth day, the hard layer of epidermis came off in one mass, leaving a delicate rose-coloured epidermis behind it. There was neither pain nor inconvenience connected with the use of the plaster, and the patient, a business man actively employed, was able to follow his usual avocation without interruption.—*Case* 2: A gentleman, aged seventy-two, who had always been healthy, was unable to walk for a period of six or seven months, on account of an attack of sciatica. When the sciatica was relieved he somewhat suddenly resumed his professional employment in the city, which at the time involved a good deal of walking on the hard pavement. The result was that the soles of both feet became hot and tender, and after a few weeks the skin of the ball of each foot became hard and horny. When he consulted the author this condition had lasted for about seven years, and gave rise to much pain and discomfort. The whole of the surface of the ball of one foot and part of the surface of the other was covered with a layer of epidermis of extreme hardness. In this hard layer there were small isolated horny formations of the nature of corns, which produced the same sensation as if the patient were walking on shot or small hard stones. The first treatment recommended was the application of strong solutions of potash and scraping with a sharp spoon, and wearing a horsehair pad in a large boot. This alleviated the condition, but the application required to be frequently repeated. The salicylic plaster relieved the condition for several months at a time.—*Case* 3: In a gentleman, aged forty-three, the palmar surface of the right forefinger had been covered for years by a thick hard fissured epidermis. After this morbid formation had been removed by the salicylic plaster, the skin of the finger had remained normal when the patient was seen by the author nine months afterwards.—*Case* 4: A gentleman, aged forty, had suffered from the condition of his heels for about twenty years. It had begun by the skin being red, tender, and scaly, and the hardness had gone on progressively increasing. The condition had been on several occasions mistaken for syphilis, and amongst other methods of treatment which had been employed in vain several anti-syphilitic courses were to be reckoned. When seen by the author the skin of both heels was covered by thick hard horny uneven masses which rendered walking very painful. Solutions of potash and a scraper which were first recommended had been used faithfully for a year almost daily, but with only temporary alleviation. When the author became acquainted with the specific action of the salicylic plaster it was recommended to the patient.

Although by its use the tendency to horny formation was not removed, yet the hard masses had been completely got rid of, the patient could walk with comfort, and with the occasional use of the plaster the fresh formation of hard masses was avoided. The author regarded the condition of which these cases were examples as being essentially allied to eczema. The formative power of the epithelium was injured mechanically or otherwise, and an imperfectly formed epidermis resulted. By its solvent power on horny epidermis salicylic acid incorporated with gutta-percha, as in Beiersdorf's plaster, frees the skin from an adherent irritating mass, and the deeper layers of the rete mucosum are placed in more favourable conditions for regaining their physiological properties.—Mr. Butlin said that Mr. T. Smith had been led to the effect of a saturated solution of salicylic acid on a wart on his own hand, which quickly disappeared under its use. Since then he had tried it in ulcerated carcinomas, and had in more than one instance found it useful in rodent ulcer and other cancers in destroying a certain amount of epithelial growth. Mr. Butlin did not know of any case actually cured by salicylic acid.—Mr. Morrant Baker had seen that day a woman with profuse gonorrhœal warts, which he had treated by salicylic "cream," which had proved more useful than anything else. There was a remedy called solvine sold for the cure of corns which was composed of salicylic acid dissolved in collodion.—*Lancet*, *Dec.* 1, 1883, *p.* 950.

VENEREAL AFFECTIONS.

56.—GONORRHŒA AND ITS CONCOMITANTS TREATED BY BELLADONNA INJECTIONS.

By JOHN ROCHE, M.D., Kingstown, Retired Surgeon, Bombay Army.

Some thirteen years ago an officer on board one of the vessels of the Indus Steam Flotilla consulted me for a bad gonorrhœa with intense pain on micturition, and intolerable chordee at night. He implored of me to give him something to enable him to stand up for a day or two, as unless he could depart by the boat that was leaving for Mooltan next morning he would come under the head of reductions, and be removed from his employment. The case was so urgent I ordered him an injection composed of seven ounces of water, an ounce of mucilage of acacia, twenty grains of extract of belladonna, and twenty grains of sulphate of zinc, a teaspoonful to be injected immediately before and after micturating, and a similar amount the last thing at night, great care to be used in passing the injection fully down as far as the pain was most intense. An ointment

of spermaceti and mercurial ointment, ʒ iv. each, and ten grains of extract of belladonna, ten grains powdered opium, a paste to be smeared along the perineum and around the crura penis at night. The treatment answered admirably. My patient left next morning having had no chordee that night, and the pain of micturition disappeared by using the injection. Within a week there was complete cure. My patient communicated the gratifying news from a station on the river Indus, and from that time I have had numerous gonorrhœal cases of every type and stage, and I have caused to be used the injection in every instance, and without exception, with unfailing success. Not long since a shop assistant presented himself to me with a bad gonorrhœa, high fever, inflamed testicle, and chordee at night. With the application of the belladonna and opium ointment the chordee did not appear, and in four days after using the injection the running ceased, but after the first application the pain and running were much lessened. A suspensory bandage was worn, and with the daily use of the mercurial and belladonna and opium ointment the patient was quite well in less than three weeks. Patients have always stated that it is the injection and not the ointment which stopped the chordee carminatively. I have tried the anodyne treatment in various classes of people, from the dissipated nymphs of the Eastern bazaars to the well fed *roué* in the West; in the acute and in the chronic and gleety stages; in first attacks and in those making one of a series; and in cases complicated with inflamed testicle and chordee; and, I have no hesitation in saying that, I have not witnessed anything to contraindicate its use, nor to mitigate its success. I am firmly convinced that gonorrhœa is simply an inflammation, and nothing more specific so far as it is induced by inoculation with urinous pus in a urinous, and therefore foul passage, intractable and painful because subject to be washed frequently by a most irritating and heating fluid, the urine, and like other inflammations of mucous membrane liable to extend to the entire extent of parts connected, and as the part inflamed is highly sensitive, the subject is liable to be attacked with much constitutional disturbance. The consequence is the expressions of any other habitual disease, or of those ailments to which the diathesis of the patient may incline. Prof. Hamilton, of Aberdeen, has shown that there is no change in the epithelium mucous membrane of the urethra in acute gonorrhœa, excepting analogous to what takes place in the bronchi in bronchitis. In fact there is no organic specific difference in the inflammation which takes place in the urethral membrane from that which occurs in the bronchial membrane.

I have ordered greater proportions of mucilage and belladonna, and have tried mucilage of tragacanth, and of starch,

and equivalent amounts of aconiti hyoscyamus and morphia with alum, tannic acid, and chloride of zinc, but for the practical purpose of preserving the mucous membrane from being irritated by the urine, and forming an emollient dressing as it were over the inflamed urethral membrane, belladonna and acacia with sulphate of zinc are perhaps the best.—*Medical Press and Circular, Nov.* 21, 1883, *p.* 436.

AFFECTIONS OF THE EYE AND EAR.

57.—TREATMENT OF PAINFUL ULCERS OF THE CORNEA.

By CHARLES HIGGENS, F.R.C.S., Ophthalmic Surgeon and Lecturer on Ophthalmology, Guy's Hospital.

Painful ulcers of the cornea are of very common occurrence amongst the debilitated and ill-fed people who make up a large proportion of hospital out-patients. Ulcers of the cornea, as is well known, are much more frequently met with among children than in adults; the phlyctenular ulcer being, perhaps, the most common form. It is not to these, however, that I wish to draw attention, but to the very painful serpiginous ulcers, sometimes known as marginal or crescentic, and the sloughing or suppurative ulcers of older persons.

The serpiginous ulcer is generally met with in feeble women rather past the middle of life. It commences as a thin ulcerated band near the margin of the cornea. The ulcer has a steep, cleanly cut, crescentic edge towards the centre of the cornea, and is flattened towards the corneal margin. The crescentic border gradually spreads over the surface of the cornea; but, as it advances, healing takes place behind it. The ulcer is accompanied by marked conjunctival and ciliary injection; and a network of very fine vessels follows it from the circumcorneal zone over the corneal surface. The ulcerated edge is preceded by infiltration and opacity of the cornea. The pain is very severe, and there is much photophobia. The ulceration rarely extends beyond the centre of the cornea, but may commence at more than one spot, and so implicate the greater part of it. It is extremely intractable and rebellious to treatment, but appears more amenable to that recommended in this paper than any other.

Sloughing and suppurative ulceration may arise spontaneously, or may be caused by injury, such as a sharp blow on the cornea from a rebounding twig or thorn, or any small foreign body. The ulcers form on any part of the cornea; we may meet with them as deep sloughy evacuations, or as collections of pus often having more the character of abscesses than ulcers,

but which, sooner or later, burst externally or into the anterior chamber, leaving a ragged ulcerated cavity. This form of ulcer is often associated with hypopyon or onyx, and not unfrequently with abscess in the iris.

The treatment by warmth and eserine is very easily carried out. The patient is directed to foment the eye for fifteen or twenty minutes three or four times a day, or oftener. The fomentation should be used as hot as can be borne, and may consist of simple hot water, decoction of poppy-heads, or camomiles. A solution of one or two grains of sulphate of eserine to an ounce of water should be dropped into the eye three or four times a day, after the fomentations have been used. A large pad of cotton-wool, thoroughly warmed before a fire or over a spirit-lamp, should be laid upon the closed eyelids, and secured by a bandage, and replaced by a freshly warmed one as often as may be necessary for the patient's comfort. The patient should be allowed to go about; dark rooms and confinement to the house always make matters worse. He should be well fed; purged if necessary; and placed on some tonic, none being better than iron in some form or other. Stimulants are rarely needed, and in many cases will do harm.

The treatment by warmth without eserine is most useful in many painful inflammations of the eyes. It was first, I believe, recommended by Mr. Liebreich. The following cases have been lately under treatment in the hospital:—

Case 1.—Amelia A., aged 45, came amongst the out-patients February 27th, 1883. She had "marginal ulcers" in both eyes; the left being the worse. She was ordered the yellow oxide of mercury ointment to be applied to the conjunctiva at bedtime, and to take two ounces of liquor ferri dialysati three times a day. This treatment was continued till March 6th, when she was ordered guttæ eserinæ ter die; to continue the medicine. On March 13th, she was rather worse. The treatment by warmth and eserine was commenced. She was ordered a mercurial purge at night, and senna draught in the morning. On April 3rd, there was much improvement; by April 10th, she was nearly well. She was ordered atropine, as some posterior synechiæ had formed.

Case 2.—Susannah G., aged 18, came to the out-patient department March 9th, 1883. The left eye had been lost some years, from ulceration of the cornea and perforation. In the right, there had been a deep ulcer, leaving opacity, for which iridectomy had been performed. At the time of her visit, there was a deep sloughing ulcer at the seat of the old opacity; there was much pain, and perforation of the cornea

appeared imminent. The patient was admitted at once, and placed on the warmth and eserine treatment, and ordered twenty minims of liquor ferri dialysati thrice daily. On March 30th, the ulcer had filled up; there was no pain or intolerance of light. She was made an out-patient; the fomentations and bandaging were discontinued. The eserine and dialysed iron were repeated. On April 10th, a rather large and dense corneal opacity remained. There were no signs of inflammation or ulceration.

Case 3.—Amelia O., aged 29, had been under treatment, off and on, for recurrent ulceration of both corneæ for the last five years. On March 6th, 1883, she again presented herself with ulcers on both corneæ. She was ordered one-fifth of a grain of sulphate of atropia in a drachm of ointment of yellow oxide of mercury; a small portion to be placed inside the lower eyelids at bedtime. She was also ordered fifteen grains of liquor ferri dialysati three times a day. On April 3rd, she was rather worse, and was ordered eserine-drops, hot fomentations, and bandaging with cotton-wool; to continue the dialysed iron. The treatment was continued up till April 17th, when she was much improved.

Case 4.—Mary A. P., aged 33, came amongst the out-patients April 17, 1883. The right eye had been inflamed and painful some days; there was a large irregular ulcer near the upper margin of the cornea. She was ordered eserine-drops three times a day, hot fomentations frequently, and to bandage with pad of cotton-wool over the eye. On April 24th, the ulcer was nearly healed, and the pain entirely relieved.

Case 5.—Jane W., aged 45, consulted me May 10th, 1883. She had been under treatment by atropine and tonics for three weeks, without benefit. There was a superficial marginal ulcer at the upper and outer border of the left cornea. The eye was very painful. She was ordered hot fomentations, eserine-drops three times a day, a pad of wool, and a bandage, and to take twenty minims of dialysed iron. On May 17th, there was great improvement. By May 20th, the eye had quite recovered.

Case 6.—Ernest A., aged 14, was first seen March 27th, 1883. He suffered from phlyctenular ulcers of the right cornea. He was treated for three weeks with belladonna-lotion to the eye, and fifteen minims of dialysed iron internally, without benefit. He was then ordered hot fomentations, bandaging with cotton-wool, and eserine-drops; to continue the iron. He rapidly improved, and, at the end of a month, was quite well.—*British Medical Journal, Nov.* 3, 1883, *p.* 865.

58.—ON INCREASED HARDNESS OF THE EYEBALL, AND ITS TREATMENT BY ATROPINE OR ESERINE.

By JOHN TWEEDY, F.R.C.S., Prof. Ophthalmology, University College, Surgeon to Moorfields Ophthalmic Hospital.

Increased hardness of the eyeball is one of the most conspicuous symptoms of glaucoma, and is, indeed, so closely identified with it that many persons now regard "glaucoma" and "increased tension" as synonymous. In this there lurks a fallacy—a fallacy which in some instances is not wholly devoid of danger. Though increased tension is one of the most prominent features of glaucoma, there are other diseases, in which increased hardness occurs, which are not glaucomatous, and which call for entirely different modes of treatment. Glaucoma, as we understand it, has only been definitively differentiated since 1856, when Von Graefe introduced and recommended the operation of iridectomy for its relief.

It is necessary at the beginning to dismiss from your minds all associations between the etymological and the pathological meanings of the term glaucoma. Etymologically glaucoma means a greyishness, or bluish greenness, of the crystalline lens, whereas pathologically it denotes a group of symptoms in which this colour phenomenon may or may not be present. Glaucoma, in the pathological sense, has been variously defined and explained. By some it has been stated to be a serous form of irido-choroiditis; by others, a neurosis of the secretory nerves of the eyeball; by others, a hardening of the sclerotica. But the researches of pathologists and of microscopists have shown that glaucoma is not a specific and idiopathic disease, but rather a group of symptoms dependent upon certain abnormal physical states of the eyeball. The peculiarity of glaucoma is increased hardness of the eyeball, due to an accumulation of the fluid contents within the globe, resulting from diminished elimination. The physical state which causes this is a narrowing or obliteration of the corneo-iridian angle of the anterior or aqueous chamber. In glaucoma this angle is obliterated, either in consequence of the iris lying in apposition to the cornea, or from its being actually adherent to the cornea.

Naturally, at the periphery of the anterior chamber, there is an angle between the posterior layer of the cornea and the anterior layer of the iris. In this angle is a delicate meshwork of fibres, formed by the continuation of the membrane of Descemet, or posterior elastic layer of the cornea, on to the iris. The membrane of Descemet breaks up at the periphery into delicate fibres, which anatomists designate the *ligamentum pectinatum iridis*. These fibres are now known to be lined by

endothelial cells, and to open into lymphatic spaces, called the spaces of Fontana. These spaces, in their turn, communicate with the canal of Schlemm, which forms a vascular plexus around the cornea. Fluids are secreted by the ciliary body, and perhaps the posterior layer of the iris for the nutrition of the lens and for the formation of the aqueous humour. In the natural state this fluid finds its way from the posterior chamber of the aqueous into the anterior chamber, and, having served its purpose, escapes through the spaces of Fontana, thence into the canal of Schlemm from which it is finally carried away by the anterior ciliary veins. As long as the spaces of Fontana and the adjacent vascular canals are unobstructed the fluids secreted by the ciliary body find their way out of the eyeball, and the equilibrium between secretion and elimination, of the anterior segment of the eyeball at all events, is maintained.

In a large number of eyes, however, this equilibrium is disturbed; secretion goes on while elimination is diminished or arrested, and hence the accumulation occurs which sooner or later gives rise to increase of the intraocular contents, manifesting itself by increased hardness. Now, in true glaucoma this elimination is checked in consequence of the periphery of the iris being pressed forward, and, it may be, actually united with the cornea, so that the fluids which are still secreted by the ciliary body cannot make their escape through the drainage-apparatus at the angle of the anterior chamber. This accumulation after a time sets up irritative changes, as all accumulations do, which may proceed, either abruptly or gradually, to inflammation, or so-called acute glaucoma. The anatomical condition of true glaucoma is, therefore, a shallowing of the anterior chamber, preventing the escape of fluids through the meshwork at the corneo-iridian angle. The aim of the practitioner is to relieve this obstruction either by surgical or other procedures. What these are we shall consider by and by.

While in glaucoma the hardness of the globe is associated with a *shallowing* of the anterior chamber, there is another condition of increased hardness of the eyeball associated with a *deepening* of the anterior chamber. Wardrop described a disease which he designated Inflammation of the Capsule of the Aqueous Humour. In this disease the anterior chamber is very deep, and in the early stages of the disease there is considerable increase of tension of the globe. Some surgeons fail to make any difference, so far as treatment is concerned, between increased hardness of the eyeball with a shallow chamber and increased hardness with a deep chamber. In both the increased hardness is doubtless due to diminished

elimination, though in both, and especially in Aquo-Capsulitis, there is, in addition, increased secretion. In Aquo-Capsulitis, however, the diminished elimination is presumably due to the closure of the openings from the anterior chamber into the spaces of Fontana by a coating of inflammatory lymph, such as is found in serous pleuritis. The lining membrane of the anterior chamber being inflamed and covered with adhesive lymph, does not allow of sufficient drainage, and this gives rise to accumulation within the anterior chamber accompanied with hardness. This disease is, however, totally different in its origin and course from glaucoma, and calls, in many respects, for a different plan of treatment.

There is yet another cause of increased hardness of the eyeball, apart from the hardness that is sometimes associated with tumours of the interior of the eyeball, and that is iritis. In iritis the increase of tension may be as great as in true glaucoma, though the two demand different and indeed opposite kinds of treatment.

Let me explain that for the kind of increased tension which occurs in acute glaucoma that there is only one permanent remedy, and in severe cases no alternative, viz., iridectomy. The history of the introduction of iridectomy for glaucoma, and of its universal recognition as a therapeutical measure, supplies a typical illustration of the history and methods of practical and scientific medicine. When Von Graefe first performed the operation he did it tentatively, and without a clear notion of its mode and action. For many years the operation was practised in a manner purely empirical, though successfully. No one knew how or why iridectomy cured glaucoma. It is only within the last four or five years that the *scientific* employment of iridectomy for glaucoma has been possible. Of the *practice* of iridectomy Von Graefe uttered the first and the last word. He laid down at least two conditions of efficient iridectomy for glaucoma, namely, first, that the portion of iris removed should be as broad as possible, and secondly, that it should be taken as far back as possible. With these conditions all ophthalmic surgeons have always complied. We now know the reason of this. In the natural condition you observe the wide space intervening between the iris and the posterior layer of the cornea, and at the angle these lymphatic spaces which, as I have already said, are concerned in the drainage of the interior chamber. On the right side this angle is obliterated, and the periphery of the iris for some distance is lying close to or is adherent to the periphery of the cornea. The object of iridectomy is to remove as far as practicable this adherent portion. In order to do this it is necessary that the incision should be made far back, at the very outermost portion of

the anterior chamber. Otherwise only the free portion of the iris will be removed, and the drainage angle will be unaffected.

It is, however, not my intention to speak of the treatment of glaucoma and the other forms of increased hardness of the eyeball by *surgical* measures. I wish rather to call attention to some of the prophylactic and pharmaceutical remedies in each of the three principal forms of increased hardness.

Two classes of drugs have been found to exercise special and peculiar effects upon the size of the pupil. One class, of which atropine may be regarded as the type, dilates the pupil, and another class, of which calabar bean, or its active principle eserine, may be taken as the type, contracts the pupil. These two classes of drugs are the sheet anchors of ophthalmic therapeutics, and a knowledge of their action furnishes the key to a large part of ophthalmic pathology. Pupil dilators, or mydriatics, are essential to the cure of iritis and for the prevention of its recurrence; and pupil contractors, or myotics, are almost equally certain and effectual in the cure of the slight forms of true glaucoma, and for the relief of severer forms.

In inflammation, the iris becomes gorged with blood and filled with inflammatory products, so that the pupil is diminished in size, and, may be, becomes blocked and occluded with lymph. The aim of the surgeon is to prevent this occlusion. The surest way of doing this is to apply locally some powerful mydriatic, so as not only to empty the iris as far as possible of stagnant blood, but also by dilating the pupil, to prevent the effusion of lymph on to the pupillary area of the anterior capsule of the crystalline lens. Atropine is the most convenient mydriatic. Mydriatics are of further use in iritis, in so far as they afford physiological rest to the inflamed tissue of the eyes, and rest, as you well know, is an indispensable factor in the repair of all damaged tissues. When a bone is broken, or a joint dislocated, the surgeon, after reducing the breach of continuity, endeavours, as far as practicable, to ensure physiological rest by means of splints and bandages. The ophthalmic surgeon aims at the same end in iritis, by applying, say, atropine to the inflamed iris. Splints and bandages are here, of course, out of the question; but atropine, whatever may be its precise *modus operandi*, gives to the inflamed tissue that amount of rest which is essential to its recovery. In iritis, therefore, of any form, and probably in any stage, the local application of atropine or some other mydriatic is of prime importance.

But in using atropine you should take care not to mistake other forms of inflammation for iritis. It has been known for

many years that the application of a solution of atropine to the eye may be quickly followed by a sudden and violent outbreak of acute glaucoma. Every ophthalmic surgeon of much experience must have seen eyes that have been blinded from the application of a single drop of atropine. I am, however, convinced that these eyes were already on the verge of glaucoma, and only needed the slight bias which the action of the atropine could impart in order to complete the disaster. From the casual observation that atropine sometimes precipitated glaucoma, it was empirically suggested that calabar bean being antagonistic to atropine might be serviceable in relieving or checking glaucoma. Accordingly, calabar bean was used in this tentative manner for the relief of glaucoma, and often with decided benefit, long before any rational explanation of its mode of action was forthcoming. We can now supply this explanation. As I have already explained, whenever an eye is lapsing into the glaucomatous state, that is, when the anterior chamber has become shallowed from the advancement of the periphery of the iris, so that it lies in apposition with the cornea, the application of a mydriatic, causing the radial fibres of the iris to contract, tucks as it were the mass of the iris into the angle of the anterior chamber, and leads to a complete arrest of the drainage through the spaces of Fontana. In such an eye glaucoma is always more or less imminent, and in such atropine should always be avoided. Contrarily, a pupil contractor may be of service in such a case, not only by relieving glaucoma when actually present, but also by retarding its progress, or even preventing it altogether. Though the iris may lie close behind the cornea, there may be sufficient interval to allow the escape of enough of the secretory fluids to preserve the balance between secretion and elimination. If from any cause, whether from uncorrected hypermetropia, injury, sudden fright, neuralgia, or neurosis in which the secretion from the ciliary body becomes suddenly increased in quantity, the pressure of fluids from behind push forward the periphery of the iris it acts like a closed valve, and prevents further escape of the fluids from the anterior chamber. In such an eye the application of a myotic or pupil contractor may suffice to draw the iris away from the cornea, and to allow of the resumption of the functions of the drainage apparatus. The periphery of the iris is a fixed point, and by contracting the pupil, which is a movable point, the arch of the iris, as it were, flattened, and thus the space between it and the posterior layer of the cornea is increased, so that fluids can once more find their way through the angle of the anterior chamber into the anterior ciliary veins.—*Practitioner*, *Nov.* 1883, *p.* 321.

59.—TRANSPLANTATION OF CONJUNCTIVA FROM THE RABBIT TO THE HUMAN SUBJECT.

By J. R. WOLFE, M.D., F.R.C.S.E., Senior Surgeon Glasgow Ophthalmic Institution, and Lecturer in Anderson's College.

Of all the various injuries of the eye, burns of the conjunctiva have been considered the most tantalising and unsatisfactory to deal with. When the whole cornea has been rendered opaque, the case is hopeless, and there is an end to all surgical interference. But in cases in which the cornea has escaped, or is only partially implicated in the injury, and the burn is principally confined to the conjunctival sac, there is adhesion of the lid to the eyeball (symblepharon), and we have a difficult problem to solve. The condition of things is as follows: The lower lid, generally, and sometimes also the upper, is adherent to the eyeball, which is covered and rendered immovable. Immobility of the globe and inability to raise the lid takes place even when the conjunctiva of the upper lid is not implicated in the burn.

Here, then, we have an eye, which is otherwise useful or capable of being rendered tolerably so, but which is tied down—buried, as it were—under an adherent lid, and rendered immovable. All the contrivances resorted to by surgeons to separate the lids from the globe have proved a mere waste of ingenuity—have, in other words, ended in disappointment. Impelled by a feeling of perplexity, and a conviction that something might be done to save such eyes—to bring them to the light of day, and restore their mobility—I tried to fill up the lacuna by conjunctiva from the rabbit.

The result of my first operation was submitted to the Glasgow Med. Chir. Society in Dec. 1872, and at the meeting of the British Medical Association held in Edinburgh in August 1875, I exhibited two cases. One was that of a boy aged nine, who had had his right eye burnt with lime. The whole conjunctiva and also the greater part of the cornea was implicated. Having first made an artificial pupil, and thus restored some measure of sight to the eye, I then operated for the cure of symblepharon by transplantation. The patient was exhibited ten days after the operation, when some of the ligatures still remained in the conjunctiva. It could thus be seen that some portions of the transplanted membrane had assumed a pinkish appearance, while other spots had still a greyish look. This was a case particularly favourable for demonstration. Fig. 1 shows the extent of the injuries done by the burn to the conjunctiva and cornea, and the sight and mobility restored by the operation. It shows also the position of the ligatures in the transplanted membrane.

The second case which I exhibited at the meeting was that of Peter Campbell, quarryman, then aged 22, who had received an injury in his face and eyes from an explosion of gunpowder in January 1872. His whole face was riddled by the powder. His left eye was completely closed by symblepharon and the greater part of its cornea burned. Both the upper and lower lids of the right eye were completely everted and adherent and the cornea ulcerated by exposure. In the left eye I made an iridectomy upwards, which resulted in tolerably good sight when the upper lid was raised, as seen in Fig. 2.

In January 1873 I remedied the symblepharon by transplantation from the rabbit. This case was a remarkable one, and I shall return to it presently in connexion with the formation of the lids of the right eye. This method of conjunctival transplantation has been practised successfully by such eminent surgeons as Professors von Weckar, Paris, Otto Becker, Heidelberg, Albrecht Graefe of Halle, and others, and I have been in the habit of resorting to it whenever I wished to supply a deficiency of conjunctiva.

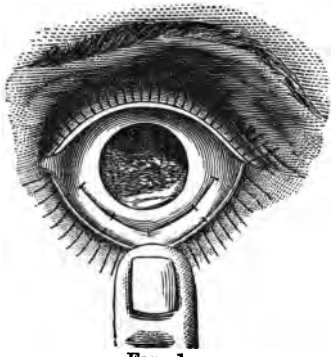


FIG. 1.

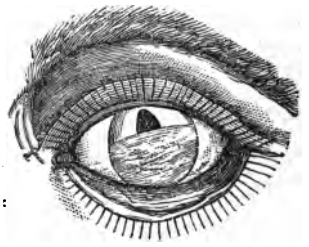


FIG. 2.

In July 1883 I had a case which I had intended to exhibit to the British Med. Association in Liverpool, but to my great regret I was unable to attend that meeting. The following notes of the case were taken by my assistant, Dr. Thompson:—"*Symblepharon and ankyloblepharon (total) cured by transplantation from the rabbit:*—Jeremiah Jones, steel worker, aged 22, got his left eye burned by a flash of slag from the forge hammer nine years ago. He was under treatment at Workington for four months, after which he was sent to the Manchester Eye Infirmary. Here (he states) attempts were made to keep the eyelids apart by means of strings and lead and a ring round his

nose. When he came to the Glasgow Ophthalmic Institution, on March 17, 1883, the eyelids were completely closed, the free borders of the lids were obliterated, so that the dissection of the upper and lower lids from the globe was effected with great difficulty. 'Buried under the lids' is an exact description of the state of the eye in this case. When the lids had been dissected, we found that only the upper and outer quadrant of the cornea was transparent—the rest was quite opaque. By means of ligatures inserted into them the lids were kept separate, and an artificial pupil was formed in front of the transparent cornea. The symblepharon was subsequently remedied by transplanting conjunctiva from the rabbit. The conjunctival sac is now free through its whole extent, except at the inner angle, where there is a slight adhesion. The eye is movable in every direction, vision is restored, so that the patient can see the time on a watch-dial distinctly."

In my two last cases the operation has been performed as follows:—The patient is put under chloroform, and also, at the same time, two rabbits; one being kept in reserve in case of accident. In this connexion I may mention that I find the grey wild rabbit more suitable than either the white or black; the conjunctiva in it is tougher and stronger and stands handling better. Dr. Noyes of New York also recommends black instead of white rabbits. I then separate the adhesions, so that the eyeballs can move in every direction. I then if necessary enlarge the external palpebral opening of the rabbit so as to enable me to evert the lid better for dissection. Ligatures are then introduced into the conjunctiva of the rabbit to mark the extent of the membrane to be removed; by means of the ligatures it is put on the stretch and dissected with strabismus scissors. The membrane is spread out on the back of my hand and left to dry there while I finish the preparation of the part for its reception. The flap is cleaned and trimmed, after which it is slightly moistened and then removed to its new site. It is now at once stitched to the fore border of the lid which is at the same time strongly everted, spread out carefully, and secured at the *cul-de-sac*. I generally find eight ligatures sufficient to keep the transplanted membrane in its place. The ligatures are left in for four or five days before they are removed.

For the last contribution to the literature of the subject I am indebted to Dr. Noyes of New York, who has in some particulars modified my method of proceeding and some of whose suggestions merit consideration. He reports that, soon after the operation was announced by me, he made trial of it, and that he was on more than one occasion aided by Dr. Little, who was then (1873-4) his assistant in the New York Eye and Ear

Infirmary, and who has recently published a case of his own. In describing his operation Dr. Noyes says:—"When it [the flap] has been separated, I put it into a saucer of tepid water and fasten it on a submerged piece of cork by the points of threaded needles. I now trim it to proper shape; next I carry it on the cork to the eye, and run two of the threads from the piece into their places in the patient's eye. Then, taking out the needles from the cork, draw their threads from the piece and pull it into its place and lay it out smoothly. I apply it to the eyeball, and cover as much of the lid and globe as possible. To make the *cul-de-sac*, the stitches are brought through the eyelid and tied over a bit of stick on its outer surface. As many as ten stitches or more may be required to hold the piece in place."

Among American surgeons Dr. Noyes first applied this operation to the formation of the sac for the purpose of fitting in an artificial eye when the natural cavity has become contracted, but Prof. Cohn of Breslau had previously performed the operation for a similar purpose. Dr. Noyes immerses the conjunctival flap in salt water (1 per cent.) as he thinks that it protects the epithelium of the conjunctiva. Dr. Noyes's cases now number about a dozen, and he reports that, "in no instance have I met with an entire failure, while the degree of benefit has been various."

During the last eleven years I have operated in thirty-five cases by this method, and my own experience is that the operation proves highly satisfactory, considering the character of the cases we have to deal with. But I attach great importance to putting the flap down in such a way that there is no curling up or twisting, and so that no mistake can be made as to which is the epithelial surface.

There is one question, and that a most essential one, as to the durability of the operation. It is satisfactory to make a conjunctival sac, but how long will it last? Do the surfaces by constant friction tend to adhere? I have just now (Nov. 30, 1883) come across one of the patients whom I exhibited at the Edinburgh meeting mentioned above, and could not resist the temptation of having his photograph taken. In his case the conjunctival sac is still as perfect as it was eleven years ago. Both eyes are perfectly good. He has been all the time working at the quarries. The upper and lower lids of the right eye which we had corrected by skin flap from the arm are good and serviceable. It will be seen that in the lower lid the skin, which we had transplanted from the arm, is not only intact, but bears a row of hairs at the border representing the lashes —somewhat abundant, and out of shape to be sure, but still there they are. There was no hair on his forearm when we

removed the skin from it (he was then a young man of twenty-two), but now it has grown. The vitality of the transplanted skin flaps is thus demonstrated.—*Practitioner*, *Jan.* 1884, *p.* 14.

60.—TREATMENT OF SYMPATHETIC OPHTHALMIA.

By CHARLES BELL TAYLOR, M.D., F.R.C.S.E.. Nottingham.

When an eye is injured, and its fellow becomes sympathetically inflamed, the chances of preserving or restoring sight are, as a rule, so slight, that I am sure that any record of cases in which this desirable end has been attained will be received with interest by all who have had any experience in ophthalmic surgery.

Case 1.—E. P., aged 28, while engaged at a steel manufactory, received a blow from a piece of metal on the right eye. He was seen at once by an eminent ophthalmic surgeon, and treated. In the course of a few weeks the left eye became sympathetically inflamed. The injured eye was then extirpated; but, in spite of every care, the case went on from bad to worse until sight was completely destroyed. The patient was treated energetically by his medical attendant from first to last; but was ultimately dismissed, assured that his case was incurable, and advised to enter a blind asylum. In despair, he came to me. The case was most unpromising; but I determined to try what could be done. The pupil was completely closed, reduced to a point, blocked with lymph, and adherent to the capsule of the lens.

I first performed an iridectomy upwards, making an aperture, which closed. I then made another downwards, which also closed. Three weeks after the last operation, I removed the lens; but, as often happens in these cases, the pupil again became blocked with lymph and inflammatory deposit. I then, with a pair of fine scissors, cut out a piece of iris and tough membrane, thus forming a large pupil, which has since remained open; and the patient has now excellent sight for all ordinary purposes, and, with a lens, can read moderate-sized print.

Case 2, that of C. B., a male, aged 36, an inmate of Grantham Union, was exactly similar in all its details. One eye, the left, had been extirpated in consequence of accidental injury, and the right had been destroyed from sympathetic inflammation, so that sight was reduced to bare perception of light. Repeated operations, with extraction of the lens and entire removal of iris and inflammatory exudation resulted in the restoration of excellent sight, both for distant and near objects.

In the transplantation of skin with a pedicle, I have been in

the habit, in certain cases, of supplementing lost tissue by the transplantation of skin from the immediate neighbourhood, either retaining the pedicle permanently, when this can be done without scar, or dividing it so soon as the skin has secured an attachment in its new situation. In this way, an excellent result was obtained in a case where both eyelids, and considerable portion of adjacent tissue, were destroyed from extensive sloughing, in a case of inoculation from a beast affected with malignant pustule; and in another case, where it was necessary to extirpate the upper eyelid for sarcoma. The one in which both eyelids were destroyed is now perfect.

With regard to cataract operations, I have succeeded in many cases, by means of the alternate use of atropine and eserine, in securing a central and movable pupil. — *British Medical Journal, Dec.* 22, 1883, *p.* 1231.

61.—ON THE OPERATION FOR INTERNAL AND EXTERNAL SQUINT, WITH A SIMPLE METHOD OF TREATING AGGRAVATED CASES OF THE LATTER CONDITION.

By CHARLES BELL TAYLOR, M.D., F.R.C.S.E., Surgeon to the Nottingham and Midland Eye Infirmary.

The operation for convergent strabismus is usually attended with most favourable results, and provided that the tendons only of the internal recti are divided but little after-treatment is required. The method I have adopted in such cases is a modification of the late Von Graefe's operation, whose practice I had an opportunity of witnessing when a student in Berlin. Von Graefe used to make an incision directly over the insertion of the internal rectus, expose the tendon, and divide it on a small hook. This procedure involved either an open wound or a suture, and in order to obviate the inconvenience attending the insertion and subsequent removal of a thread, I have been in the habit of making an incision directly over the lower border of the internal rectus muscle, inserting a small hook beneath the tendon, causing the extremity of the hook to project beyond its upper border and cutting on the point, thus dividing the attachment of the tendon under the small bridge of conjunctiva, which is allowed to remain. In this way we have a small puncture and counter-puncture, but no open wound, and the tendon, and the tendon only, is divided as readily as though it had been laid bare. The accompanying photographs before and after operation are average specimens of some thousands of cases on which I have operated in this way since my connexion with the Nottingham and Midland Eye Infirmary.

Such satisfactory results, however, do not always attend our

efforts, and inexperienced operators are apt to leave the patient in a worse condition than before the operation. Here is a case, originally one of internal strabismus, which was operated upon by a surgeon in a distant county some eight years ago. It will be seen in this case that the internal squint had become converted, by injudicious operation, into an aggravated external strabismus. Indeed, the photograph hardly conveys an adequate idea of the extent to which the eyeballs protruded and diverged. Such cases, whether traumatic, acquired, or congenital, require very careful treatment, and the operations I have devised for their relief vary according to the extent of the deformity.

If the case is slight I divide the external rectus subcutaneously, and insert a suture just over the tendon of the inferior rectus. Having thus secured the control of the eyeball, I turn it inwards and secure it in this position by attaching the suture to the internal canthus. This forced inversion of the eyeball is maintained for some days, and the external rectus, being as it were compelled to attach itself further back on the eyeball, loses its power of abnormally diverting the globe and the deformity is removed.

In medium cases I divide the internal and external recti muscles subcutaneously, and secure inversion as before. In this case the internal rectus is brought forward and the external rectus is thrown back. The advantage of these methods of operating is that there is no open wound, no risk, and very little inconvenience to the patient.

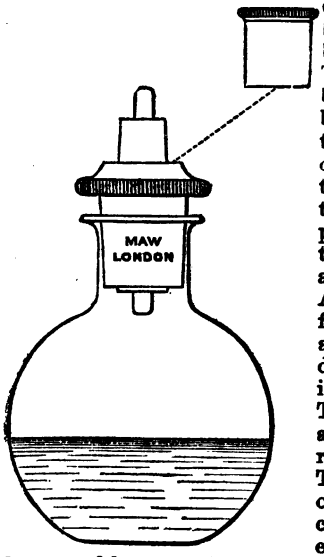
In very marked cases I have endeavoured to simplify the ordinary and somewhat formidable operation by merely shortening the internal rectus, leaving the external rectus untouched. This is easily done by catching up the internal rectus tendon on a hook, exposing it, and freely separating its attachment to the sclerotic, seizing the tendon with forceps, and by two horizontal snips converting it into a narrow strip. The base of this strip is then transfixed by a needle armed with a thread, half an inch or more of muscular tissue cut off, and a firm attachment to the sclerotic immediately over the inferior rectus tendon secured by perforation with a needle attached to the other extremity of the thread. The two ends of the ligature are then carefully drawn together, while the eyeball is turned inwards, and any required amount of inversion is thus obtained. This method of operating is quite as successful in result as any operation can be. It is scarcely more formidable than the ordinary tenotomy for internal squint. The external rectus is untouched, only one suture is required, no anæsthetic is usually necessary, and the operation is one that admits of rapid execution.

Imperfect operations for external strabismus are apt to be followed by more or less marked return of the deformity. I have not, however, observed many such cases in my practice. Here is a photograph of a patient on whom I operated six years ago. I had quite lost sight of him until he called upon me just a week ago, to ask if I would give him a copy of his original likeness, as the men with whom he worked positively refused to believe that he had ever had anything the matter with his eyes.—*Practitioner*, *Dec.* 1883, *p.* 420.

62.—A NEW FORM OF EYE DROP-BOTTLE.

By H. MACNAUGHTON JONES, M.D., M.Ch., F.R.C.S.I. & E.

The essential qualities in a good eye drop-bottle are—1. Convenient size; 2. Ready, but not too rapid, dropping of the fluid; 3. Exclusion of the air and protection of the liquid from dust particles when the bottle is not in use; 4. Protection from the influence of light. Liebreich's well-known drop-bottle, which I have used for several years past, has certain drawbacks and disadvantages. I have found these in practice to be—*a*. Uncertainty of flow; *b*. The cork, when the bottle has been a little time in use, becoming loose, and the glass tube also loosening in the cork; *c*. Exposure of the solution to the action of sunlight; *d*. Entrance of dust particles. To procure a bottle in which these defects would be obviated appeared to me a great want. Accordingly I have had made for me a bottle by Messrs. Maw and Son, as depicted in the drawing. These bottles are made in two colours, blue and yellow. The stopper is made of rubber and vulcanite, and fits accurately and tightly the neck. The vulcanite portion is all in one piece, and forms in the centre the narrow tube for the exit of the fluid. This stopper is covered by a neatly-fitting air-tight cap. The entire bottle, of the exact size shown in the drawing, is very light, and, as in the bottle of Liebreich, by simply holding it in the hand



and inverting it, the drops are expelled. There is no waste. For the use of eserine (so prone to decomposition) duboisine, pilocarpine, gelsemine, and atropine, or nitrate of silver, by preventing the entrance of dust or the rapid generation of fungi, and arresting the action of light on the alkaloid, this bottle will be found of great use. There is an obvious advantage to the surgeon and patient in the different colour of the glass which distinguishes at a glance, and without label, the nature of the contained solution. It is comparatively inexpensive.—*Medical Press*, 1884.

63.—ON THE VALUE OF THE COTTON-PELLET IN DEAFNESS.

By THOMAS BARR, M.D., Aural Surgeon to the Western Infirmary, and Lecturer in Anderson's College, Glasgow.

Yearsley, in 1848, was the first, in this country, to draw attention to the improvement in hearing which is sometimes produced by placing a moistened pellet or ball of cotton-wool over the remains of the tympanic membrane in cases of perforation. Toynbee, making use of this suggestion, introduced, in 1853, his so-called artificial drum, consisting of a disc of India-rubber connected with a silver wire. The use of the cotton-ball or pellet of Yearsley, or some modification of it, is now generally preferred by aural surgeons to the India-rubber disc. The cotton is sometimes used dry, especially when it is intended to soak up moisture in the ear; but a moistened ball of cotton is, in my experience, much more effective in improving the hearing than dry cotton. I generally moisten it with glycerine, well diluted with water, or with vaseline; if there be still suppuration, I find it advantageous to the suppurative process to soak it in a suitable astringent or antiseptic solution. The cotton may have the form of a ball, or it may be disc-shaped; in the latter case, I employ two or three layers of surgeon's lint, connected together with thread, in preference to cotton-wad; while a piece of thread attached to it, and which lies in the canal of the ear while the cotton is in position, enables the patient to remove it at will. When I am satisfied of the usefulness of the cotton-pellet, I carefully instruct the patient in the method of introducing and withdrawing the cotton by means of fine forceps having a weak spring. Very frequently, after such training, the patient becomes much more dexterous than the surgeon in manipulating with the cotton in the ear. The use of the cotton has the following advantages over Toynbee's artificial membrane. 1. It is softer and excites much less irritation. 2. It is a convenient medium for applying astringents or other medicaments to the interior of the ear. 3. It does not

cause disagreeable noises in the ear during chewing, as does the wire of Toynbee's membrane. And 4. It is not visible at the orifice of the ear.

The efficacy of the cotton depends very much on the precise place to which it is applied and the degree of pressure exerted by it. The situation where it is most likely to be beneficial is the upper and back part of the inner wall of the tympanum, over the situation of the stapes. The next most likely place is the upper part of the manubrium. If the perforation is small, I generally try the application of a small cotton-disc over it. But in determining whether, in a given case, this mode of treatment will prove useful, we must patiently and carefully try the moist cotton-pellet on one spot after another with varying degrees of pressure. In many cases, before admitting failure, I repeat these efforts at two or three different times. As a rule, when we hit upon the proper place, we have the good effect immediately; but I have known patients who found no benefit until it had remained in the ear several hours. When we find that this method of improving the hearing is successful, great caution should at first be exercised, so as to avoid irritating the ear and producing inflammation or suppuration. Great varieties are met with among patients in regard to the irritability which may be produced by such a foreign body as a piece of cotton. In a small number it is quite impossible to wear it, owing to the irritation produced, even by contact for half an hour; while on the other hand, I not unfrequently meet with those whose ears can tolerate the contact of moist cotton-wad for months at a time without inconvenience. In a large number of persons, it is well, at the beginning, to limit the use to one hour each day for a few days, gradually extending the time until we reach eight or ten hours per day. Unless there is remarkable tolerance of its contact, it should not be used at night. During the first few days, I see the patient daily, and the cotton employed has a piece of thread attached to it, so that the patient may, after the allotted time has expired, remove it. When acute inflammation exists in the ear, or when there is profuse suppuration, I apply no form of artificial membrane, until these conditions have been removed. It must not be persisted in when its most limited use excites inflammation or giddiness. It is also inapplicable to young children. I never recommend it in persons whose hearing is very good in one ear, or even, although both ears are affected, where the deafness is not marked.

These artificial helps to hearing have sometimes a capital effect, rescuing deaf persons from solitude to all the enjoyments of society. Many persons without such aid can hear speech only when spoken close to the ear; while, with the aid

of a pellet of cotton properly adjusted, they hear ordinary conversation perfectly well. Even in cases of almost total deafness, decided improvement is occasionally effected; although, as a rule, when the deafness is extreme, no benefit is produced by the artificial tympanic membrane. Slight improvement is very common, and even such moderate improvement may be of great value, perhaps averting exclusion from public meetings. My experience accords with that of Politzer, that an occasional pause of a few days is often followed by still better hearing. I have, now and again, found that improved hearing has continued for some time after the removal of the cotton. It has to be admitted, however, that in a number of cases the artificial support has no effect in improving the hearing, although with greater experience, most aural surgeons feel that the number of such cases becomes less.

We cannot in any given case determine merely from the pathological conditions present whether this mode of treatment will prove beneficial. The test of experiment is our only guide. Such a test is sometimes provided by the patient before coming to us. If he informs us that the pouring into the ear of a few drops of oil, glycerine, or water, has the effect of improving the hearing for a time, we shall, with great probability, find that the moist ball of cotton will have a beneficial effect on the hearing. Lately, I met with a somewhat remarkable instance of the application of fluid to the interior of the ear as a means of improving hearing. It was the case of a young gentleman in whom large perforations existed in both ears, and the deafness was a serious hindrance to the performance of his duties. He discovered that water poured into his ear had a striking, though somewhat temporary, effect in improving his hearing. For fully a year before coming to me, he had, generally as often as twenty times in a day, resorted to the pouring of cold water into his ear, in order to enable him to snatch for a time as much hearing-power as enabled him to get on in his business. His delight was great when he found that a pellet of cotton soaked in glycerine and water had as good, and far more permanent, effect.

The way in which the improved hearing is brought about by the artificial tympanic membrane is not fully understood. It is certain that this is rarely due to the mere closure of the gap in the membrane; indeed, this has often an injurious effect on the hearing. The good effects are probably produced, in most cases, by pressure exerted upon some part of the ossicular chain, either directly or through the intervention of the remnant of the tympanic membrane. When, on account of disarticulation between the incus and stapes, or when a portion or the whole of the incus has been removed, the continuity of

the ossicular chain is lost, and the stapes is deprived of its due support, and fails to exercise a due amount of pressure upon the fluid of the labyrinth, the application of the cotton-pellet, by pressing upon the manubrium or upon the long process of the incus, probably restores the continuity of the chain; or, if the incus is gone, the pressure exercised upon the stapes by the artificial support may restore the due amount of pressure upon the labyrinthine fluid. I frequently find that the cotton has to be well pressed into the situation of the stapes before a beneficial effect is secured.

I think there are some cases in which the improvement is due to diminishing the tension of the chain of ossicles, and thus relieving improper pressure upon the fluid of the labyrinth. This is Knapp's theory of its action. In these cases, the pressure of the artificial support is exerted upon the short process of the malleus, which is above the axis of motion of the ossicular chain, and the upper arm of the lever is pressed inwards, while the lower arm, together with the incus and stapes, is moved outwards. I have rarely seen advantage to the hearing derived from the pressure of a moist disc of cotton-wad upon the tympanic membrane, when the latter was not perforated. We may suspect, in such rare cases, that the continuity of the chain of bones has been, from some cause, disturbed.—*British Medical Journal, Oct.* 13, 1883, *p.* 722.

MIDWIFERY,

AND THE DISEASES OF WOMEN AND CHILDREN.

64.—ON HODGE'S PESSARY AND ITS MODIFICATIONS.

By G. ERNEST HERMAN, M.B.Lond., M.R.C.P.Lond., F.R.C.S., Obstetric Physician to the London Hospital, &c.

Hodge's pessary is essentially this: *a rigid frame which prevents inversion of the vagina.* This effect is the only one it invariably produces. The great merit of Hodge's invention appears to me this: that he discovered the shape of the pessary which, without exerting undue pressure at any point, keeps the walls of the vagina extended to a greater degree than any other. There is abundant evidence to show that imperfection of the vagina is not by itself enough to produce displacement of the uterus. But it is also the fact that no displacement of the uterus, except flexion, can occur without some change in the shape of the vagina. Consequently, if we can prevent change in the shape of the vagina, we can greatly limit displacement of the uterus.

It may be pointed out that retroversion of the uterus cannot occur without displacement forwards of the upper end of the vagina. When simple prolapse of the uterus takes place, the vagina becomes inverted, its upper part (with the uterus) sinks into the lower, and this inversion increases with the degree of the prolapsus until the vagina becomes turned inside out. If we prevent this inversion of the vagina from taking place, we prevent the uterus from coming down; and if we hinder the upper end of the vagina from moving forwards, we hinder also the cervix uteri from doing so, and thus prevent retroversion. This is the function of Hodge's pessary: to prevent inversion of the vagina, and to prevent the upper end of the vagina from moving forwards. It does this by filling that canal with a relatively rigid frame. This effect a properly fitting Hodge always produces; its effect upon the shape and position of the uterus is not always the same, and is in many cases unimportant.

But the usefulness of Hodge's pessary is not confined to cases of simple prolapse or of retroversion. Retroversion is often combined with retroflexion. In many such cases we are able, by the use of this instrument, to place and keep the uterus in a position of anteversion; and when this is done,

the intra-abdominal pressure (which, when the uterus was retroverted, acted on its anterior surface, forced the fundus lower down, and so produced bending of the organ) acts on the posterior surface of the uterus, and opposes the continuance of the flexion. In this way Hodge's pessary will often remove retroflexion.

But this effect upon retroflexion is not invariable. If the uterine tissue be very soft, so as to bend very easily, then the effect of the pessary, in pushing the posterior vaginal *cul-de-sac* upwards and backwards, may only be to pull the cervix upwards and backwards without altering the position of the body. If this be the effect, the cervix will be drawn closer to the body, the bend will be made sharper, and the end of the pessary will enter the angle on the concavity of the flexed uterus.

There are also cases of retroversion in which Hodge's pessary fails to antevert the uterus. In some women the uterus is found lying in, or nearly in, the axis of the pelvic outlet, its position appearing to be due to, or at least associated with unusual shortness of the vagina. In such cases the instrument will somewhat raise the posterior *cul-de-sac*, but it will not antevert the uterus. Its posterior end will press on the upper part of the cervix uteri, sometimes even on the lower part of the body, slightly raising the uterus, but not otherwise altering its position.

The pessary under consideration was called by Dr. Hodge a "lever" pessary. The only lever action that I believe it exerts is that pointed out by Schultze, and to which attention has been drawn in this country by Dr. John Williams. The uterus itself is the lever, the body of it is the weight, the fulcrum is the attachment of the uterus near the internal os, and the power is applied through the vagina to the cervix. It has been said to act as a lever in another way—viz., that the pessary is the lever, "the fulcrum a transverse axis, nearly through its centre, upon which it is capable of oscillating as it is grasped by the vaginal walls; the power is the pressure of the anterior vaginal wall upon its anterior limb, greatly increased during expulsive efforts; the weight, or resistance, is the fundus uteri, which is pushed up by the posterior limb." Another writer says, still more definitely, "the lower limb of the instrument being carried down as the anterior vaginal wall descends during the act of inspiration, the upper limb ascends in the posterior *cul-de-sac*, raising the fundus uteri and also pushing it forwards." This kind of lever action I have not succeeded in observing. Usually I have found that during expulsive efforts the pessary descends with the vagina without any other appre-

ciable alteration in its position. But often the anterior end descends more than the posterior, and sometimes the instrument, besides descending, does alter its inclination, the lower end moving slightly backwards, and the upper end slightly forwards; but this change in the position of the pessary is accompanied with descent, and does not, so far as my observations go, at all tend to press up the body of the uterus. Hodge's own account of it is the following:—The instrument "operates as a lever in elevating the fundus from its malposition against the sacrum to its normal position behind the bladder; that portion of the pessary which is posterior to the neck of the organ being the 'short arm,' while all anterior to the neck is the 'long arm'; and the 'fulcrum' or support is the posterior surface of the vagina. As the long arm or horn is depressed by the finger of the practitioner, the short arm rises and carries with it the body and fundus of the uterus." I have no doubt that Dr. Hodge in this passage describes correctly the change in the position of the pessary which followed the manipulation mentioned; but before accepting it as representative of the effect of expulsive abdominal effort, we need be certain that the pressure of the finger was applied in exactly the same direction as that communicated by the anterior vaginal wall during effort.

Whatever view be taken of the lever action of the instrument, it is certain that it cannot by direct pressure upon the body push a retroverted or a retroflexed uterus into the axis of the pelvic inlet. It can only do this by the mechanism described by Schultze. When the pessary does press upon the body of the uterus, the displacement is not completely removed. The effect of such pressure upon the patient's condition depends upon the state of the uterus. If the uterus be congested, and therefore tender, the pressure of a pessary upon it will generally make the patient's suffering worse. If it be not tender, then it is unimportant whether the instrument presses upon the uterus or not. Although Dr. Hodge did not describe the mechanical action of his pessary in the same way as Schultze has done, he was quite aware that it ought not to press directly upon the uterus; and that if it presses upon a tender uterus it does harm. In the quotation just given, the expression he uses is that the pessary "carries with it" the uterus. In describing the adjustment of the instrument, he says, "care must be taken that it does not press against the uterus behind." At another place he says, "in retroversion it may turn up against the body of the uterus too suddenly; indeed, will generally do so, to the discouragement of all, if care be not taken to elongate the vagina and press the instrument steadily between the uterus and rectum, so as not to impinge anteriorly against the uterus."

In applying a Hodge's pessary, we want to choose the one which the vagina will retain, which will extend the vagina and carry its posterior *cul-de-sac* as far backwards and upwards as possible, and which, while efficiently doing this, will not exercise any injurious pressure upon any one point. I propose now to compare the different varieties of Hodge's pessary from this point of view.

The simplest and the parent instrument—the one with which Dr. Hodge started, and out of which his pessary arose—is the ring. A rigid ring, large enough to fill the vagina, cannot usually be introduced without difficulty and pain to the patient, and its pressure when *in situ* is likely to be injurious. Therefore an elastic ring, the opposite parts of which can be pressed together for the purpose of introduction, and which does not exert unyielding pressure, is preferable. If the ring be thick, its pressure is more diffused, and therefore less likely to cause pain or ulceration than if it be thin. A thick elastic ring, such as is made of watch-spring, covered with india-rubber, is therefore the best. This form of instrument is stated to have been originally devised by Dr. Meigs, of Philadelphia. The Meigs ring is the simplest and safest of all vaginal pessaries. Assuming that the case is a suitable one, the only disadvantageous mistake that can be made in the application of such a ring is the choice of too large a one. If this error be committed, the unsuitability of the instrument will soon be evident from the pain it will cause the patient. But if the pessary be of proper size—that is, big enough to fill the vagina, without making it tense—its thickness and elasticity so diffuse the pressure which it exerts, that it is rare for any ulceration of the vagina to be produced. I have used these rings largely, and have never once seen ulceration result from them. The ring pessary, when retained, fulfils the main requirement—it prevents inversion of the vagina, and thus prevents prolapsus. It carries the posterior *cul-de-sac* of the vagina backwards, and thus in the same manner as a Hodge, and in most cases as effectually, prevents retroversion. Even in some cases where the ring did not when first introduced correct retroversion, I have found the uterus in the natural position after the pessary had been worn a few weeks. The thick elastic ring is especially useful where the uterus, besides being displaced backwards, is tender, or where the ovaries are prolapsed and tender; for in these cases the thick elastic pessary presses so much more gently than the rigid bar of a Hodge, that it can be borne where the latter is not tolerated. I would venture to offer this practical advice: whenever the uterus is tender, and you are not sure, after applying a Hodge's pessary, that the uterus is raised into a position of anteversion, or at least into the axis of the

pelvic brim, you will do well to substitute a Meigs's ring for a Hodge.

I may say, in passing, that there are three ways of ascertaining whether the uterus is in or near the axis of the pelvic brim. The best and only certain method is by bi-manual palpation. When the uterus is thus grasped between the two hands, its position is made out beyond mistake. But in patients whose abdominal walls are fat or rigid this may be impracticable. Then we are reduced to the use of the sound; which, if the uterus be in the axis of the brim, will, of course, easily pass up with its concavity looking forwards. If the uterus be retroflexed, it will usually not pass more than an inch or an inch and a half until the concavity is turned backwards. This method is not free from error, for I have found the sound passed with the concavity forwards straighten out a retroflexed uterus as it passed on; but this is exceptional. This method may be checked by rectal examination, by which, if the uterus be still retroflexed, its body may be felt bent back over the top of the pessary. This is not practicable when the instrument used is a very large one, for then the finger may be unable to reach above it. It is often stated that it is necessary, for the proper adjustment of a Hodge's pessary, to first replace the uterus with the sound. In the cases in which Hodge's or a ring pessary will keep the uterus anteverted, the uterus will usually assume that position as soon as the instrument has been inserted. When the pessary does not at once antevert the uterus, and this is then done with the sound, sometimes the organ will remain in its new position; but generally it falls back again directly the sound is removed. The cases, therefore, in which, according to my experience, replacing the uterus with the sound is advantageous, are very few.

Certain theoretical objections are brought against these rings. Hodge says, "Under the pressure from above, it will, indeed must, remain parallel to the plane of the perineum." To see if this were so, I have carefully measured the distance from the plane of the perineum, of the anterior and posterior parts of the ring pessary, in patients who were wearing them; and I have almost always found that the posterior end was higher up than the anterior, and that therefore the ring was not parallel with the plane of the perineum. On a matter of clinical observation I should only with great caution differ from so faithful an observer as the late Dr. Hodge is shown by his book to have been, and I have sometimes found the ring parallel with the plane of the perineum; but I am sure that it is only exceptionally so.

Another objection made is that the ring enlarges the vagina laterally, and so makes the last state of the patient worse than

the first. I think this statement is based on conjecture, and not on observation. I do not think that there is theoretical ground for it, for, according to Hart (whose statements are supported by the evidence of sections, besides being, as it seems to me, in accord with clinical observation), the anterior and posterior vaginal walls, normally in contact with each other, are triangular in shape, the base being above, and the apex below. The introduction of a ring into a loosely walled cavity of this shape, although it may slightly alter its outline, will not greatly distort it. I have seen numerous cases in which patients have worn a Meigs's ring for months, and then have been able to do without it; and therefore I believe that this supposed injurious effect of the ring is one which either only exists in imagination, or results from accidentally coincident morbid changes, or from badly fitting instruments.

The real drawbacks of the Meigs's ring appear to me to be these: first, that it is not so efficient as Hodge's pessary in carrying the posterior vaginal *cul-de-sac* upwards and backwards; next, that its posterior part, being flat, and not curved upwards, presses on the front of the rectum. If the bowels are confined, and scybala have to pass, the ring projecting backwards is apt to obstruct defæcation. This may easily be avoided by keeping the bowels regular; when this is attended to, no trouble of the kind arises. There is also the disadvantage which attends every india-rubber instrument—that when worn long by inattentive patients, they may cause vaginitis, with fœtid discharge. This is to be prevented in most cases by telling the patients, while wearing the ring, to syringe the vagina night and morning with hot water. In dealing with patients who are not very intelligent, it is well to be sure that they have a syringe provided with a vaginal nozzle of sufficient length.

Hodge's pessary cannot be more correctly described than in the words of the inventor himself. He says: "The important modification consists in making a ring oblong instead of circular, and curved so as to correspond to the curvatures of the vagina and rectum. Great advantages result from this form: the convexity of the curve, being in contact with the posterior wall of the vagina, corresponds with more or less accuracy to the curve of the rectum, perineum, and sacrum. Hence, when properly arranged, there is no pressure against the rectum . . . . The oblong form and the curvature are the two essential peculiarities of the lever pessary."

Hodge put before the profession two forms—the open and the closed lever. The open lever has never, so far as I know, been much used; and therefore I speak only of the closed lever —the one universally known as Hodge's pessary. Its peculiar

advantages are these—First, by its oblong shape, it carries the posterior vaginal *cul-de-sac* further upwards and backwards than the ring of which it is a modification. In being not a simple oblong, but smaller at the lower end than the upper, and in being slightly sigmoid when looked at from the side, it corresponds to the shape of the vagina; and, through this exact adaptation, it is kept in position by the simple pressure of the anterior vaginal wall against the posterior, no spot being used as a point of support, and therefore unduly pressed on. Further, its oblong shape permits its introduction, when made of a rigid material, without excessive pain to the patient; and this gives us a large range of choice of fabric. Thus, tin, pewter, vulcanite, xylonite, aluminium, have all been used. The respective merits of the different materials I shall not here discuss.

I would now remark on the ordinary modifications of Hodge's pessary. First, a large posterior curve has been recommended by many. The explanation usually given of its utility is that it presses the body of the uterus further up. For reasons already given, I think it cannot both do this and at the same time straighten the uterus. Its real advantage I judge to be this—that, by bulging out behind the posterior vaginal *cul-de-sac*, it gives room for the cervix to move backwards. When the posterior vaginal wall is put on the stretch, it of course becomes as nearly straight as the instrument extending it will permit, and if the portio vaginalis be long, the vaginal wall, as it approaches a straight line, must press the cervix forward. This is an effect directly contrary to that of Hodge's pessary when acting with the maximum of efficiency; for then, as has been pointed out, as the body of the uterus falls forward the cervix moves backward. The advantage of the large posterior curve is, that it makes room for this backward movement of the cervix. Next, certain alterations of the posterior end have been made, upon the theory that the pessary presses directly upon the uterus. They tacitly recognise the fact that when the instrument does so press upon a congested uterus the pressure is painful, for they seek to lessen the pain by distributing or lessening the pressure. On this principle, the posterior end has been made slightly concave, to correspond with the convexity of the body of the uterus, so that this convexity may lie in the concavity of the pessary, instead of touching it at one point only, as would be the case were the end of the instrument convex. With a similar aim, the posterior end has been greatly thickened, in order to diffuse the pressure. It has also been capped with a soft pad. I regard these modifications as suited only for exceptional cases. The pessary should not press on the uterus at all; and if it does not press on the uterus, it matters

little what is the shape of its posterior end. But when a Hodge will not straighten the uterus, but presses on it, and the uterus is tender, the soft pad is the one which makes the pressure the least severe. There are also modifications of the lower end. One of them consists in making it pointed, the theory being, that the point shall fit in between the rami of the pubes, and thus the pessary be kept in the antero-posterior diameter of the pelvis, and prevented from shifting its position so as to get across that diameter. This principle seems to me erroneous, because Hodge's pessary ought not to take its support from bony parts, or to press upon bones at all; it should be held in position simply by the vaginal walls. The change is also, I think, disadvantageous in two ways—first, the point serves as a wedge to facilitate its slipping out; and, second, the projection downwards of the point makes it inconvenient for married women. For these reasons I do not regard this modification as an improvement. Another, and most useful, alteration is that which we owe to the ingenuity of Dr. Greenhalgh. In this form the anterior end is square, and formed by connecting the extremities of the lateral limbs by pliable india-rubber. This form differs essentially, in the mechanism by which it is retained, from the original pessary of Hodge. Its especial utility is in cases in which the integrity of the vagina has been so destroyed by parturient injuries, its tone relaxed, and its lower orifice widened, that it will not retain a pessary by the mere coaptation of its walls. The lower end of Greenhalgh's instrument can be made very wide, and yet its sides can be pressed together during its introduction, so that it can be put in without pain; and when in position, the spring makes it regain its shape. It is kept in place by the pressure of its two anterior corners against the sides of the vaginal orifice, supported by the rami of the pubes. Its disadvantages are those common to all india-rubber pessaries. A variety which is retained by the same mechanism, and which is commonly used for uterine prolapse, is that in which the anterior of the two curves which give Hodge's invention its sigmoid shape is dispensed with, or replaced by a curve in the opposite direction, so that the lateral view of the pessary resembles a C more than an S. The instrument is usually at the same time widened. The effect of the change is that the anterior end is directed more forwards, and impinges on the anterior vaginal wall instead of presenting at the vaginal orifice. Consequently, expulsive pressure is resisted by the sides of the pessary pressing against the sides of the vaginal orifice. Under conditions which make the pressure from above greater than usual, this instrument, like Greenhalgh's, presses on the pubic rami. — *Medical Times and Gazette, Nov.* 17 *and* 24, *pp.* 567, 595.

65.—ON CHRONIC INVERSION OF THE UTERUS.

By J. Matthews Duncan, M.D., F.R.S., Physician Accoucheur and Lecturer on Midwifery, St. Bartholomew's.

There is nothing new in mere replacement: that is a treatment occurring as naturally to the surgeon as reduction in a case of dislocation of a bone. The novelty is in replacement after the disease has lasted long; in the demonstration that a uterus inverted for years is as easily reduced, or nearly so, as a uterus inverted for only a few weeks; and this is the very opposite of what was taught not long ago, the opposite of what, for example, I was taught as a student by my great teacher. Many women reap the advantage derivable from this novelty—this great change in doctrine and practice.

Some changes, or novelties, in practice are little in themselves, but great from the wideness or extent of their application and utility. Others are great in themselves as artificial anæsthesia. Others are great from the importance of the principle involved in the change. Some, like vaccination, may have a combination of greatnesses. The change in regard to inversion is great in itself and in the principle involved; but, unlike vaccination, the change has very limited scope in practice. Inversion is rare: were it common, the change would sound loud in the ears of mankind.

Now what is this great change or novelty in principle? It is the recognition that the result is to be attained not by a strong or violent effort, not by great force, but by a small force long applied. Not great force and short time, but little force and long time. Not the driving a nail, or lifting a weight, but the bending a bow or pulling a fish by hook out of a stream. Not the rapid opening of the womb in forced delivery, but the gradual opening in natural labour. Formerly, a great effort was made by taxis, as in the reduction of a hernia, and if it failed the case was hopeless; now the taxis is tried, and if it fails the pressure is kept up till yielding comes and the difficulty is overcome.

The failure to recognise this principle of treatment was not the only error of former practitioners, they had erroneous notions of the source of the difficulty, and used erroneous practices founded on those notions. For instance, some thought the cervix was the cause of difficulty, and that, by dividing it, the reduction would be easy. But the cervix offers only trivial resistance; it dilates easily and readily, offering no strong constriction, and it is replaced without trouble. The ordinary error is to suppose that the difficulty is caused by constriction, whether in the cervix or in the part of the uterine body, near it or anywhere else. I show you here the body of the uterus amputated for chronic inversion; if you take it and

try to undo the inversion you will soon be satisfied that the cervix offers no important resistance, for there is no cervix attached to it. You will also quickly satisfy yourself that constriction is not the cause of the difficulty, for there is no constriction. No cervix and no constriction, and the uterus in your hand, not deeply concealed in the woman's body, and yet reduction or undoing the inversion as difficult as ever, almost impossible. You may have a good notion of the difficulty by trying to invert an unimpregnated uterus, or an indiarubber ball resembling it. In the natural uterus there is as much constriction as in the inverted; that is, there is none, all parts being equally tight. The operation would indeed be impracticable were the tissues composing the uterine body not endowed with other qualities besides elasticity and distensibility, namely, with the quality of muscular relaxation. I believe the capability of replacement is mainly due to elasticity and distensibility, and partly to muscular relaxation, not relaxation of any constricting band, but of the whole uterine tissues. All operations founded on the idea of a special constriction are failures, being based on erroneous theory.

Now for the operation. You may first make a trial of immediate replacement. The woman, anæsthetised, is placed in the position for bimanual examination; the right hand is passed into the vagina; pressure is by it exerted on the fundus uteri, while counter pressure is maintained by the left hand on the peritonæal uterine cup through the hypogastric flap. Without the counter pressure the vagina would be undoubtedly stretched and, it may be, injured, and the right hand would pass far into the abdomen to follow the retreating or ascending uterus. The pressure on the fundus by the right hand is variously modified, this way or that, directly, obliquely, the rule generally held in mind being to replace first the highest part or that nearest the cervix, and so on. The pressure soon pushes the body within the cervix; and you may, therefore, suppose you are succeeding, when, in reality, you have not touched the real difficulty. Efforts may be continued long; even for hours. I have persevered till the woman was exhausted and I myself fatigued, and have failed, and I have also succeeded. This process may be called acute replacement, and should always be used in acute inversion, that is, when the inversion comes after delivery. At this time it should be strenuously urged till you succeed; sometimes it is very easy.

In chronic inversion the attempts at acute replacement often, indeed generally, fail, and then you resort to the new operation of chronic replacement, that is, you keep up the pressure on the fundus till the organ is worn out and yields. This may

be effected in a few hours, or it may take days. Much has yet to be done to perfect this process, and it may, by the ingenuity of gynæcologists, be made easier and gentler. At first the pressure was kept up by relays of assistants, now it is done by machinery.

I show you here the instruments we have used in "Martha." Any one is like a stethoscope with the ear-piece removed. The cup-like end receives the fundus uteri. At the ear-piece end are attached elastic bands, which are connected with a horizontal bandage around the body above the iliac crests. By the elastic bands the pressure is kept up. We estimated the pressure used in Mrs. C.'s case as above one and below two pounds.

The instrument causes much pain, and narcotics are required to allay it. Suddenly the woman feels the pain diminished; she may be squeamish or sick to vomiting; the elastic bands are loose; the uterus is replaced. The cup of the instrument is now lodged in the cavity of the uterine body, and so enclosed as to be with difficulty extracted. This extraction is done by the same process inverted as pushed it in, only it is done at a sitting.

After replacement of the uterus a woman readily conceives, and successfully passes through pregnancy. — *Medical Times, March* 1, 1884, *p.* 275.

66.—ON ALEXANDER AND ADAMS'S OPERATION ON THE ROUND LIGAMENTS FOR PROLAPSIONS OF UTERUS.

By Henry Lediard, M.D.Ed., F.R.C.S.Eng., Surgeon to the Cumberland Infirmary, Carlisle.

I read with much interest an account, by Dr. Alexander, of Liverpool, of a method of treatment employed by him for the relief of prolapsed uterus (see *Retrospect*, vol. 85, p. 280; vol. 87, p. 392), and I determined to put into practice, at the first opportunity, the operation which seemed at first sight to have much to recommend its adoption. Amongst the lower classes, bad examples of procidentia uteri are met with frequently, and I have often experienced considerable difficulty in finding any instrument to give any kind of support, or that could be worn with comfort.

It was not until July 4th of this year that Dr. Adams's paper came to hand; and it is evident that full justice must be done to his independent planning of the operation upon the dead body, and demonstration of the anatomical practicability.

My own experience may be useful, although it is limited to operation upon four women, all of whom suffered from complete procidentia; and I will simply give a summary of their cases, inasmuch as a detailed account of each would be tedious and

unnecessary. The ages were from thirty-three to fifty-three years; prolapse had existed from two to eight years, and pessaries were useless. The first case was operated upon on Nov. 27th, 1882, when a prolonged search was made for the ligament on one side only, but without success, the wound taking nearly three months to cicatrise. It can be said with truth that little pain was caused, and no risk to life was in any way threatened, but the result was mortifying in the extreme, for, in spite of the rest in bed, the procidentia was as bad as ever. The case was, however, instructive, seeing that failure was, no doubt, due to fraying out the ligament instead of grasping it boldly; indeed, I came almost to the conclusion that there was no round ligament present. The tedious healing was accounted for partly by the handling the tissues had undergone, and partly by the patient being obese. I hope to induce her to allow me another trial upon the opposite ligament.

The second case was more encouraging, for the ligament on one side was quickly found, shortened, and stitched to the skin; but here again the wound was about two months before it was completely healed. She came for examination on June 22nd, the operation having been performed on January 1st. The cervix was two inches within the vagina. She "could go about much better," had "no bearing down pain," and "no bladder-trouble;" and this gain was produced with shortening one ligament only.

The third case was somewhat remarkable; for, although the ligament was readily found on one side, yet, when search was made at the same time upon the other, no trace of any ligament appeared. Again slow healing followed with erythema and cellulitis of the abdominal wall, a high temperature, and dry tongue, &c., so that at the end of three months I was very glad to see the patient able to go out. The operation was performed on February 2nd, and on July 4th she came to show herself. The uterus had never come down since leaving the hospital, and the cervix was at least two inches up the vagina. Here again this result depended upon shortening one ligament only.

The fourth patient has had both ligaments shortened, an interval of three weeks intervening between the operations, the ligaments being stitched to the pillars of the ring as well as to the skin. She was undoubtedly the healthiest of those operated upon, and the wounds healed as, I take it, they ought to do, *i.e.*, in about three weeks. The result thus far promises well, for the uterus is well up the vagina; but, seeing that the ligaments were shortened on May 18th and June 11th only, it is too early to judge of the probable permanent result.

Such is a brief report of my experience of this simple operation, in the Cumberland Infirmary, and I trust that no surgeon

will be deterred from practising it by reading the account of my two failures to find the ligament sought for. The operation is almost bloodless and painless; and I am not at all sure that a slow healing of the wounds, provided the ligament remains in the new position, is not advantageous—inasmuch as the patient is confined to bed and to rest, thereby affording sufficient time for the parts to consolidate before again being put on the stretch.

In one of my cases, ether was used, and some bronchitis followed. I certainly never expected that the result would have been a success, for coughing was about the last thing wished for.

The plan I have followed is to wind the ligament, when pulled out, round a piece of stick, and leave it like a pedicle projecting through the wound, to fall off naturally; so that a sort of stump can be seen in the cicatrising part, that is, if healing be primary. I unwound the ligament from the sticks in two instances. I found the band measured two and three inches respectively. In all cases, full antiseptic precautions were taken, and the subsequent dressing was Listerian until suppuration appeared. I do not think, however, that anything more than strict cleanliness and careful adjustment of the wound is necessary, together with sponge-pressure and a gauze bandage; whilst the sooner the ligament is found, the less handling will the tissues be subjected to, and the less disturbed will they be in consequence. Careful stitching of the ligament, both deeply and superficially, is no doubt most important for the lasting success of the operation; and Dr. Alexander's recommendations, as to the "method of retaining the ligaments in their new position," should be strictly adhered to. (*Retrospect*, vol. 87, p. 393.)

In the last case operated upon, a sponge was placed in the vagina, and changed daily; it was retained without causing any discomfort, and was probably useful in steadying the uterus whilst healing went on; and I can imagine that, in cases where chloroform caused sickness, or ether set up bronchial irritation, such a practice might prove beneficial.

I note that Dr. Adams, in his paper already alluded to, mentions that the peritoneum does not follow the ligament "under the necessary traction;" but, in one of my operations, this membrane certainly did follow the ligament, but was easily stripped back with a finger; there would, however, be a risk of peritonitis were a funnel-like process of this membrane dragged along and transfixed with the needle. The surgeon will soon learn to pull with knowledge; for any violence would probably lead to rupture of the ligament, as well as injury to the peritoneum.

The spine of the pubic bone is undoubtedly the point to be

aimed at, for near it will the ligament be found; and I fully endorse all that has been laid down by Dr. Alexander, as to grasping the fat which projects from the external ring with forceps, and pulling upon it until the ligament appears.

Finally, I am disposed to believe that this operation will receive all the recognition from surgeons that it deserves; and that, ere long, we shall hear of its performance, not only in this country, but elsewhere.

Postscript.—On July 27th, I shortened the round ligament on the left side of the patient on whom I first tried this operation and failed to find the ligament. On this occasion it was found without difficulty, and drawn out about two inches.—*British Medical Journal, Feb.* 23, 1884, *p.* 354.

67.—UTERINE DISPLACEMENTS TREATED BY MEANS OF MEDICATED TAMPONS.

By Robert Bell, M.D., Physician to the Glasgow Institution for the Diseases of Women.

We are all familiar with the great power glycerine exerts in abstracting fluid from an œdematous tissue; but it may not be equally well known that this power is very much enhanced when the glycerine contains alum in solution. Moreover, the presence of alum, by virtue of its astringent properties, gives tone to the vaginal wall and the uterine wall and supports. The tampon, therefore, when saturated with a solution of this salt in glycerine, and properly applied in flexions or versions, acts in three different and beneficial ways—1st, as a support; 2nd, as a depleting agent; and 3rd, as an invigorating agent to the uterus and vagina. If we take a typical case of retroflexion and observe the objective symptoms only, what do we find on making a digital examination per vaginam? If the displacement has existed for some little time, the uterus as a whole will be found enlarged and flabby. This, of course, may be partly ascribed, in one who has borne children, to subinvolution of the organ; but that it is not always due entirely to this fact is evidenced by this hypertrophy occurring in nulliparæ who are subjects of retroflexion. The os and uterine canal will be gaping and patent throughout, and from it will ooze a continuous stream of acrid, muco-purulent discharge, often so irritating in its nature as to induce vaginitis. The vaginal portion of the cervix is excoriated; its mucous membrane bulges out, producing ectropion. The uterus, but more especially the retroposed fundus, is acutely sensitive to touch, and there is frequently hyperæsthesia of one or both ovaries. Now it is quite evident that all these symptoms are not due to the mere fact of the organ being retroflexed, but to the effects of the altered relations of

the fundus and body to the cervix, and the consequent traction upon the uterine ligaments and thus upon the blood vessels, but more especially upon the veins. The hypertrophied organ, if complete rest is not enjoined, may by degrees become more and more prolapsed till at length the flexion will be cured at the expense of a procidentia. We will not, however, follow the progress of the malposition so far as this, but study it only as a retroflexion. By degrees, of course, the circulation will accommodate itself to the altered circumstances, and the acute stage gradually give place to the chronic, when sensitiveness to touch will in like ratio diminish. Yet the general symptoms of distress do not disappear as a coincidence, nor have the difficulties of treatment been removed. I have seen, in a considerable number of instances where a retroflexion has been suddenly produced by a fall—very frequently on the ice—most obstinate metrorrhagia induced. In these cases, however, it was noteworthy to observe that the train of acute symptoms did not present themselves, as congestion was naturally absent. Yet what, to my mind, is an important factor of inflammation of the uterus in every case of retroflexion was present, viz., the checking of the venous return-flow by compression of the walls of the vessels at the point of flexion.

It will be obvious, that if we can, while taking advantage of the depleting power which glycerine is known to possess, at the same time augment its power in that respect by the addition of an agent which will simultaneously, by its styptic powers, reduce the arterial supply, and by its astringent properties induce contraction of the uterine muscular fibres, and thus naturally assist in the expulsion of the venous blood,—I say it will be obvious that we shall to a very considerable extent counteract the evil effects of the malposition. Now, alum is endowed with these powers in a most marked degree. It has the further advantage—and it is no inconsiderable one, I can assure you—that it does not stain the underclothing of the patient, like some other astringents. It is still further to be recommended because of its effect on the catarrhal discharge, which it coagulates, and consequently prevents its decomposition. By this effect it destroys the irritating properties of the discharge. Under its employment by means of the tampon, as a result of this property, I believe, papillary ulcerations rapidly disappear and hypertrophy of the cervix subsides. In simple endocervicitis, which, I am of opinion, in a great number of instances, if not actually induced, is at least rendered chronic by decomposition of the natural secretions, it proves of immense benefit. If to the therapeutic properties which the medicated tampon possesses we add its ability to act as a support, when properly applied, to the dislocated fundus, and moreover, that it can be gradually made to exert an increasingly

greater amount of power as the hyperæsthesia of the uterus becomes reduced, it must be acknowledged that it can be employed as a pessary when the ordinary vaginal pessary would be a most dangerous instrument to insert. The tampon forms a bed for the dependent fundus to rest upon, and it is easily moulded to suit the exigencies of the case. Each successive tampon by degrees elevates the fundus until it is made to occupy its normal position, while simultaneously the hypertrophy and congestion are being removed by the therapeutic properties of the medicaments with which the tampon is saturated. When the normal position of the uterus has been re-established, it is retained there either by a continuation of the treatment for a little time, or, if it is thought more advisable, by the application of a well-fitting vaginal pessary. It not unfrequently, however, has happened in my experience that the tampon has accomplished all that could be desired, a complete recovery having been the result, and this often when a pessary has been worn for years without affording relief. In like manner, when prolapsus is present, especially when due, as it frequently is, to a greater strain being thrown upon the uterine ligaments and vaginal wall by the constant dragging of a subinvoluted organ, we observe the immense benefit derived from this tampon. It matters not whether the hypertrophy, as in subinvolution, is the primary cause, or whether it is secondary to the prolapsus, which we know often is the case—I say it matters not how the prolapsus has been produced, or in what manner the hypertrophy has arisen, we obtain the dual effect of the tampon and relief of the symptoms.

Its application is rapidly followed by a reduction in the size of the organ, a cessation of the uterine catarrh, and a healing of any excoriation that may exist. At the same time the uterus rises in the pelvis and speedily assumes its normal position. In cases of ruptured perineum or troublesome retrocele and cystocele it is my invariable habit to precede operative interference by a course of tampon treatment. It tends very much to ensure the success of the operation by reducing the bulk and weight of the uterus, and in consequence renders it more easy to obtain a successful result. For the same reasons this method is most useful in procidentia. — *Edinburgh Medical Journal, March* 1884, *p.* 811.

68.—ON FIBROUS TUMOURS IN THE CERVIX UTERI EXPELLED IN AN UNUSUAL MANNER.

Observed by Prof. STADFELDT, Copenhagen.

I have just now observed the termination of a very unusual course of disease in a female patient suffering from fibrous tumours in the tissue of the cervix uteri, which tumours spon-

taneously and successively have been expelled *externally*, out from the cervix through the vagina. The first details of the case were published some years ago in a Danish dissertation but little known. As it now appears that the case is likely to have a successful end, I hope that an account of it may have some interest for the Society.

H. B., a widow, aged 44, came under my care in June 1875. She had borne children three times, the youngest child being 21 years old. Suffering for three years from menorrhagia and from difficulty, or often total inability, to pass water, she had consulted different medical men. On making a vaginal examination a large tumour, the size of a full-grown man's head, was found to the back and left of the cervix; the os uteri to the right side. The tumour was, generally speaking, hard, differing in parts, and somewhat elastic, lying in and filling up the brim of the pelvis. It had grown one inch above the whole of the anterior wall of the pelvis, but the lower end was somewhat more pointed and reached nearly to the entrance of the vagina. The sound was easily introduced four inches and a quarter into the cavity of the womb, but much to the right side. The upper part of the vagina was distended by the tumour, and highly stretched in the circumference of the brim. The bladder was pushed upwards, and the urethra elongated so that the sound had to be introduced eight inches before reaching into the bladder. After dilating the cervix with sea-tangle bougies, the finger was introduced, passed easily four inches into the cavity, and confirmed the result of the vaginal examination in regard to the situation and the size of the tumour. The fundus uteri, not much enlarged, was discovered to the right, joined to the tumour.

She came, in the commencement of the year 1876, under my care for operative treatment, when a part of the tumour like a large polypus was expelled out of the vulva. The polypus had a short, very thick pedicle upon the outside of the cervix to the left from the os uteri. The discharge from the vagina was somewhat fetid, and the woman's share of health not good; she suffered from fever, had sickness and loss of appetite. I carried the galvano-caustic wire around the pedicle, and cut through without difficulty. The bleeding was inconsiderable; she made a good and rapid recovery, and the difficulty in passing water and the metrorrhagia were accordingly lessened. The tumour removed had a diameter of three inches and a half. It was an œdematous fibro-myxom, including a single small cystic cavity, the pedicle very muscular.

Several similar tumours were successively expelled from the cervix, always to the outside from this, three times in the course of the first year. The first of these was a polypus as

large as a lemon, the second weighing 500 grammes, and the third 686 grammes in weight. Finally, the last, the tenth polypus, was pushed down and removed in September 1880. The state of health before and after the operation was always the same, the bleeding very slight, although the last polypi were removed with the ecraseur, and not with the galvano-caustic wire. The recoveries were always speedy. I keep the ten tumours preserved in spirits, in our museum, Saxborphianum, and their combined weight is at present 2850 grammes.

In the three years since the removal of the tenth tumour the patient has had good health. The difficulty of passing urine and the menstruation are gone, and from an examination made in August 1883 it seems probable that she is cured of her protracted infirmity. I then found that the large tumour in the cervix had quite disappeared. The lips of the uterus were short, and attached to the back part of the shrunken upper portion of the vagina. The os uteri formed a transverse open slit. The anteflected cervix uteri was somewhat enlarged, and contained a little fibrous tumour in the anterior wall. The patient's health and appearance were quite good.—*Edinburgh Medical Journal, Jan.* 1884, *p.* 606.

69.—DIAGNOSIS OF FIBROID TUMOURS OF THE UTERUS.

By Alfred Meadows, M.D., F.R.C.P., Physician-Accoucheur, and Lecturer on Obstetrics, St. Mary's Hospital.

The increased and increasing experience which we are almost daily gaining of the surgical treatment of fibroid tumours of the uterus; the courage, tempered wisely, as I believe it is, with discretion, which is leading us on to attack these growths, that were, until comparatively recent times, regarded as lying outside the domain of legitimate surgery; these and similar considerations make it matter of the utmost importance that our diagnosis of the several varieties of these growths should be carefully conducted, be based upon a true and correct estimate of the clinical phenomena which they present, and so lead to the avoidance of mistakes in our surgical interference, and to consequent diminution of the risks and dangers which such interference entails. I believe that our knowledge and experience of these growths is now sufficiently extensive to enable us to diagnose with tolerable certainty the class of cases in which operative interference is not only justifiable, but likely to lead to a successful issue at least as regards the removal of the growth. As a general rule, I am persuaded that a correct diagnosis can be made of the exact situation of these tumours, and therefore of the treatment applicable to them. I confess I have not yet arrived at the conclusion that they ought all of

them to be subjected to surgical interference, though I see indications that that is the rule towards which all experience seems to be tending. Undoubtedly, that experience has taught us that, with proper safeguards, and under favourable conditions, the peritoneal cavity may be opened with comparative impunity; so that, if then the growth be of a kind, in regard to its situations and relations, that its removal can be effected with but little difficulty, the risk will be in proportion; if, on the other hand, the difficulties and consequent dangers be very great, then we may resort to what I would term the physiologico-surgical method of treatment, which not only involves comparatively slight risk, but, in all probability, gives an assurance of ultimate cure by physiological starvation, if I may coin such an expression. I am, of course, alluding to the operation of removing the ovaries for the arrest of menstruation, and the consequent stoppage of that blood-supply and functional activity which necessarily accompanies ovulation. The experience of careful observers has taught us that, with the decline of functional activity, arrest of these growths ensues; and the obvious conclusion to be drawn from this fact, which is of almost universal application, is, that surgical interference can anticipate that event; and, since experience has demonstrated the tolerance of the peritoneum in cases where it is opened, the removal of the ovaries for the arrest of these growths becomes as it were a necessary corollary to all that has gone before.

These latter remarks apply with almost equal force to all the varieties of uterine fibromata, whether growing in the substance of the uterus itself, or situate upon either its subserous or submucous coats. And this leads me to say a few words in regard to the classification of these growths. It has been recently suggested that we should discard the classification of these tumours hitherto generally accepted, and that their individual characters should be the basis of our classification, wholly irrespective of their situation and relation to the uterine walls. I confess I am unable to agree to this proposition; and my objection to it is based solely on the want of clinical precision, and the utterly negative value of the classification which Mr. Lawson Tait proposes should supplant the one now commonly received. In my opinion the one is founded on clinical experience, while the other is only of post mortem interest; the one enables us to diagnose with accuracy and precision, while the other fails apparently to recognise the clinical importance of characteristic symptoms. The study of the one leads to sound scientific treatment, from a correct appreciation of clinical phenomena, while the other leads to nothing, and only begins and ends with itself. In what I have to say, then,

on the subject of the differential diagnosis of the various forms of uterine fibromata, I shall regard those forms simply or primarily in relation to the uterine walls, for it is to this relation, and this only, that the leading symptoms have reference.

I may remark, in passing, that microscopical examination of these growths has long since taught me that they are widely dissimilar in their minute structure. Sometimes they seem to be little more than simple hypertrophies of the ordinary uterine tissue, but they are never entirely so, for there is always a considerable proportion of cellular elements; and in some cases these abound to the almost entire exclusion of the fibrous character. I have noted also that the proportion of these cellular elements varies partly with the rate of growth of the tumour, being found much more abundant in those tumours which have grown rapidly; and partly also the proportion varies according to the situation of the growth, so that tumours which are subperitoneal are more fibrous and less cellular than those which are interstitial or submucous, and the converse equally obtains. It follows also that the latter, being more cellular, have a much more rapid growth than the former. This rate of growth, then, not only indicates a distinct peculiarity of microscopical structure, but it also points to a particular site as occupied by the growth, while this again affords information in regard to the treatment required for its removal.

I have said that there is an obvious advantage, from a practical point of view, in classifying these tumours according to their situation in relation to the uterine walls; because, when we come to study them at the bedside, we shall see that all their symptoms point distinctly to this one fact; and the practical value of this classification consists in this, that according to the situation of the growth, so will the treatment be regulated. A tumour, for instance, which can be diagnosed as entirely intra-uterine, will require a mode of treatment wholly different to that which one situate upon the peritoneal surface necessitates; and it is obviously important to be able to differentiate between these two, especially from a study of their clinical phenomena; this, to a very great extent, I am satisfied we are able to do. I adhere, then, to the old system of classification of these growths into the three varieties of submucous, subperitoneal, and those, lastly, which lie between these two, but which are neither the one nor the other, though they may incline at one time more to the one than the other—I mean the interstitial variety, or those growing within the substance of the uterine wall, being surrounded on all sides with uterine tissue, to the assistance of which we look in our management of this variety by the process of enucleation.

A few words on each of these three varieties will fitly lead up

to a description of their several symptoms, and to their consequent differential diagnosis. First, then, as regards the submucous group. These are originally developed immediately under the mucous membrane, and as they grow they project more and more towards the uterine cavity, which they invade and distort to a greater or less extent, according to the size of the tumour. When very minute, they are, of course, interstitial, but they become submucous as they develop. It has been thought, and I incline to the belief, that, by the active efforts of the muscular fibres behind or beneath them, they are gradually projected from the bed in which they were originally developed, and hence they grow in the direction where there is least resistance, which is in this case the uterine cavity; and some authorities have suggested that by a further development of this process, the growth is actually extruded, its point of attachment narrowed, and so ultimately it becomes polypoidal in character, with a more or less slender stalk, and covered all over with uterine mucous membrane. I have already alluded to the microscopical characters of this variety, to the fact that they generally possess more of cellular and less of fibrous elements, and that they are also of more rapid growth.

The subperitoneal variety are the exact opposites of these submucous forms. They are believed to originate in the uterine wall, very near to the peritoneal surface, and to be gradually extruded in precisely the same way as the other variety, viz., by muscular action forcing them also in the direction of least resistance; and, in some cases, leading by the same process to the formation of a pedunculate or polypoidal form of growth, hanging in the peritoneal cavity instead of in the uterine cavity. This variety grows much more slowly than the former, and is characterised by a much greater preponderance of the fibrous elements over the cellular forms of structure; they are accordingly much harder, and sometimes present almost a cartilaginous feel.

Both of these growths have, as I shall show presently, well marked and distinctive features, which separate them not only from each other as regards their clinical characteristics, but also from the remaining group, viz., the interstitial, or intramural. These, according to my observation, grow much more quickly than either of the other two, and are, in consequence, largely composed of cellular elements. The greater freedom of blood-supply probably accounts for this fact. As they grow they may incline more to one or other of the uterine surfaces, and in proportion as this occurs, so will the uterine cavity be more or less influenced, distorted, or enlarged, a point which is obviously important from a diagnostic point of view, and one which is happily within our cognizance by means of the uterine sound.

Of all these growths, it may be remarked that they are much more frequently developed in the fundus and body of the uterus than in the cervix. Indeed, it is very rarely that we meet with them in the latter situation. Moreover, they are more often met with in the anterior than in the posterior wall —at least, according to my observation—and I may add that, for purposes of enucleation, there is more risk and greater liability of failure when they are situated in the anterior than in the posterior wall. I believe that the greater risk is due to the presence of more cellular tissue in the anterior than in the posterior *cul-de-sac*, and to consequent greater liability to the occurrence of cellulitis, abscess, &c.

As regards the symptoms of these several varieties and their differential diagnosis, these may all be classified under three heads, namely, disordered menstruation; irregular discharges, either of mucus or blood; and, lastly, pain. These all exist, but in very varying degrees, in all cases of uterine tumours of the kind we are considering; and, moreover, the differences in degree in which these appear afford us valuable indication as to the site and character of the growth; so that the more one or other of these three symptoms preponderates, the more easily can we assign to any given tumour its proper place in the classification I have adopted as regards the relations and attachments of these growths; and when such an assignment is strengthened by careful and complete local examination, both with and without the aid of an anæsthetic, then, in truth, we shall be able to arrive at a diagnosis as accurate as the nature of the case can possibly admit of.

Broadly speaking, I have observed that the two chief symptoms, pain and discharge, whether of mucus or of blood, are invariably proportioned the one to the other; so that if there be much pain there is generally very little discharge; and, *per contra*, hemorrhage is seldom associated with severe pain. Again, I have observed, as a clinical fact, that the existence of great pain on the one hand, or of severe hemorrhage on the other, may be taken as a tolerably sure indication of the position of the growth in its relation to the uterine walls. In the former case, the tumour will probably be near to the peritoneal surface, while in the latter it is near to the mucous surface. Pain thus associates the tumour with the peritoneal coat; while discharge, whether of mucus or of blood, refers the tumour to the mucous or discharging surface: and the more the tumour projects into the uterine cavity, the more polypoidal it becomes, and the larger the exposed surface of mucous membrane with its capillary circulation, the more full, as a rule, will be the discharge. In the submucous variety, therefore, this is the one characteristic feature. In the interstitial variety this also holds good, though to a much less extent.

The above remarks refer more especially to the menstrual discharge; but it is not only in this respect that there is so great an increase of the flow, for in the intermenstrual periods also there is often a very considerable discharge in the submucous variety of uterine fibroma. Here the discharge is of a watery mucous character, more or less tinged with blood. This symptom is altogether wanting in the subperitoneal variety, and is often absent, or but very slight, in the interstitial form of growth. Sometimes this intermenstrual discharge takes the form of very free hemorrhage, especially when the tumour is polypoidal. Such a thing seldom or never occurs in the subperitoneal variety, and is nearly as rare in the interstitial, while it is almost universal as a symptom of polypoidal tumour, and, when it exists, the amount of discharge bears a far nearer relation to the situation than to the size of the growth; a very small tumour which is wholly polypoidal will bleed or discharge far more than one which is much larger, but is situate in the substance of the uterine-wall. Hence the diagnostic value of this symptom as differentiating the different varieties of uterine tumours; for an uterine fibroid which is not accompanied by any watery discharge, and does not give rise to excessive menstruation or to irregular discharge of mucus or blood, is not, as a general rule, so placed that it can be surgically treated *per vaginam*, but must be attacked, if at all, abdominally.

Sometimes intra-uterine tumours take on a sloughing process, and the discharge then becomes peculiarly offensive. This occurs more often when the tumour is projecting through the os into the vagina, and a casual examination might easily lead to such a growth beiug mistaken for cancer of the cervix. I have more than once known this to occur, but the differential diagnosis is easily made by carefully observing that in the one case the finger can be passed all round the mass, and feels a ring of healthy tissue—the cervix—through which the sloughing mass is protruding; while, in the case of carcinoma, the cervix being the part affected, no such ring of healthy tissue can be made out, for all is infiltrated with the cancer.

So much for the discharges which are present in, and characteristic of, these uterine fibromata; by noticing the amount of this, very important conclusions may be drawn as to the situation of the growth, and as to the mode by which, according to its situation, it may best be treated by surgical interference.

There is yet one other symptom which affords very valuable aid in the differential diagnosis of the three varieties of uterine fibromata, I mean pain. I have already said that, as a general

rule, pain and discharge are inversely proportioned the one to the other, and they indicate very plainly the situation of the growth in regard to the uterine walls. An uterine polypus, or a submucous fibroid, may grow to a very considerable size without occasioning any pain. An interstitial tumour may give rise to some pain; but a subperitoneal growth not only may, but will cause very considerable pain, and especially during the menstrual period, though it is by no means confined to that time; nor is the pain at all proportioned to the size of the growth, but it will have close relation to its situation. For instance, a subperitoneal fibroid will be much more painful on the anterior than the posterior wall of the uterus, and the nearer it is to the fundus, the greater will be the amount of pain, and the more constant will it be. Sometimes it will cause a flexion of the fundus on the body of the organ, and then mechanical difficulties in the escape of the menstrual fluid will occasion dysmenorrhœa. There is nothing peculiar or distinctive about the character of the pain in these uterine fibromata, except in this respect, that the situation of the tumour will determine the seat of pain. For instance, if the pain is felt in the lower dorsal or upper lumbar region, then probably the tumour is growing from the fundus uteri. If, on the other hand, the tumour is more limited to the body of the uterus, then the pain will be felt in the lumbar region alone; and, lastly, if the cervix be the seat of disease, then the pain will be felt mostly over the sacral region. In all these respects, there is nothing which specially characterises these tumours, for disease of any kind in the parts of the uterus thus indicated will give rise to pain in these several localities, and in all cases it is due to the anatomical arrangements and distribution of the nerves of the different parts of the uterus, the fundus, body, and cervix uteri being supplied by nerves derived from different parts of the sympathetic system, and being also in communion with different nerves of the spinal system. We may, however, differentiate between the merely mechanical pain produced by flexion in menstruation, and that due to fibroid tumour, by the fact that, in the former, the pain is felt chiefly, if not entirely, in connection with menstruation, while in the latter it is constant, being due to the ever present fibroid. Vaginal examination is, however, that upon which the diagnosis will chiefly turn; and then it will be found that though probably the cervix will maintain pretty much its normal size, shape, and position, both in the cases of flexion and of small subperitoneal fibroid, yet its tissue will be changed, so that in the former it will probably be softened, while in the latter it will most likely be hardened. In flexion, there will generally be much tenderness and softness in the flexed part,

while in fibroid tumour there will be little or none of either. Speaking generally, too, the fibroid will be more mobile than the flexed fundus, though this will depend, in the case of the former, upon the extent of attachment of the tumour to the uterus. The more pedunculate it is the greater will be the mobility.

But, it is in the employment of the uterine sound that we must look for greater accuracy of diagnosis; for in the case of flexion, the sound will enter the flexed portion, while, in the case of fibroma, no such direction is observed. The sound in this latter case passes onwards, leaving the lump referred to wholly unaffected by it. When this is the case, flexion of course is excluded, and the lump is probably either an ovarian or a uterine tumour; if the former, we shall find that, while the sound is *in utero*, movement of the tumour has little or no effect upon it; but, if the latter, then the slightest movement of the tumour affects the handle of the sound, which thus becomes an index, pointing to the uterus, rather than the ovary, as the seat of the growth. No doubt, there is often difficulty in the differential diagnosis of small ovarian and uterine fibroid tumours; but in the former the tumour and the pain are both unilateral, in the latter they are central; in the former there is no increase of menstrual discharge, nor any menorrhagia or other irregular discharge of mucus or blood, in the latter all these are present; in the former the tumour is elastic and tense though firm, in the latter it is hard and solid; the former feels like an india-rubber bag tense with fluid, while the latter feels like a solid india-rubber ball.

Where the tumour is much larger, there is generally less difficulty in the differential diagnosis, not only of ovarian and uterine tumours, but also in the different varieties of the latter. In the case of the submucous form, the uterine cavity is necessarily elongated, and the measure of its length indicates not only the nature of the case, but the probable size of the tumour. In the subperitoneal variety, the cavity of the uterus is not necessarily, nor even commonly, enlarged, at least not to any degree corresponding to the size of the tumour. The sound, in these cases, affords no indication as to the size of the growth, which must be judged of by external palpation, but it gives almost conclusive evidence as to the uterine character of the growth; for, with the sound *in utero*, any movement of the tumour internally is communicated at once to the uterus, and may be seen by its effect on the handle of the instrument. This point is seen with even greater distinctness in the case of the two other varieties; for, with them, the very slightest movement of the tumour is at once transmitted to the handle of the sound. In the case of an ovarian tumour of large size, the

evidence afforded by the use of the uterine sound is entirely negative in character; it is, in fact, a simple negation of all I have just described. Moreover, the clinical history is very dissimilar in the two cases. Fibroid tumours of large size are almost invariably associated with menorrhagia, metrorrhagia, or intercurrent uterine hemorrhage, and more or less watery discharge. Ovarian tumours, on the other hand, have none of these things. Uterine fibroids have usually a very long history, extending over many years, and often producing comparatively slight constitutional disturbance. Ovarian tumours, on the other hand, grow much more rapidly, often produce great emaciation, and generally give rise to some constitutional disturbance. Then, as regards the tumour itself, this is central in the uterine variety, lateral in the ovarian; freely movable in the former, comparatively fixed in the latter; nodular or otherwise irregular in shape, hard, solid, and non-fluctuating in the case of uterine growths; exactly the opposite in the ovarian, their shape is generally uniform, very seldom nodular, always, or with very rare exceptions, fluctuating, seldom or never hard, and scarcely ever solid. Percussion is the same in both cases. Auscultation occasionally, but by no means frequently, gives, in the case of fibroid tumour, a distinct *bruit*. This is extremely rare in ovarian tumours; but I have met with it now and then, so that it cannot be relied upon for diagnosis. *Per vaginam*, the tumour is found much more closely related to the uterus in the uterine than in the ovarian tumour; especially in the submucous and interstitial rather than in the subperitoneal variety. So, again, hardness, solidity, and irregularity of surface are found in the one; while elasticity, rotundity, and a sense of fluctuation are met with in the other. As a general rule, it may be said that there is more deformity and more displacement of the uterus, as revealed by vaginal examination, in the case of uterine fibroma than in the case of ovarian tumour. In the above remarks will, I believe, be found a brief epitome of all the leading differential symptoms of the several varieties of uterine fibromata.—*Brit. Med. Jour.*, *Oct.* 13, 1883, *p.* 716.

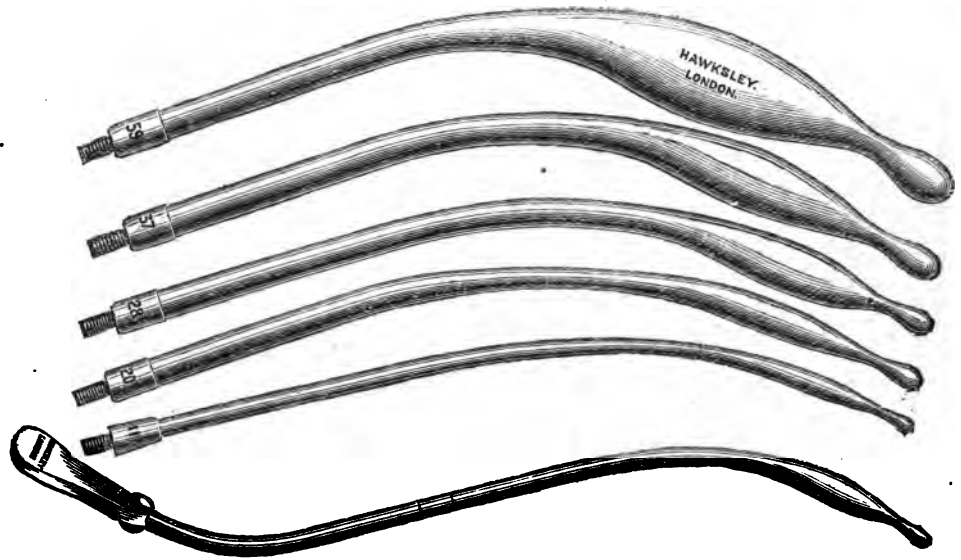
70.—ON A NEW FORM OF UTERINE BOUGIE.

By H. Macnaughton Jones, M.D., F.R.C.S.I. and Edin., Examiner in Obstetrics, Royal University of Ireland, &c.

Dilatation of the uterine canal for intra-uterine medication, for sterility, and for obstructive and so-called spasmodic dysmenorrhœa comes constantly within the province and practice of every general practitioner. One of the soundest therapeutical steps I know of in gynæcological therapeutics is the application of nitric acid to the cavity of the fundus uteri in

such abnormal conditions as corporeal and cervical endometritis or in subinvolution. Here the uterine isthmus should be dilated. Again, in those tedious cases of anteflexion with stenosis of the isthmus or contraction complicating sterility, dilatation is called for, and the step must be carried out by the ordinary medical attendant. All practitioners are familiar with the use of the usual tents, laminaria and tupelo. I have had greater satisfaction with the latter than the former in practice. On two occasions I have seen dangerous and alarming symptoms follow the use of laminaria tents. Uterine colic, symptoms of collapse, violent pain, and syncope occurred within four hours after the tent was introduced. Quite recently I placed a laminaria tent of small size in the uterus of a lady suffering from endometritis, with contracted isthmus, preparatory to the use of nitric acid. I remained away six hours. I experienced the greatest difficulty in its removal. The tent had swollen above and below the constriction into an hour-glass form. I had to bring it away with forceps. Such cases are apt to be followed by various degrees of metritis. Frequently practitioners have expressed to me their dislike to use seatangle tents from similar consequences following their employment in their hands. In cases of sterility, for some years past I have several times dilated the uterine canal with soft conical metal bougies—the same as those used by Mr. Teevan for male urethral dilatation—and pressure, and which I have found so beneficial in those semi-strictured conditions accompanying chronic gleety discharges. For dilatation of the female urethral passage, these bougies of mine will be found to answer admirably. They are easily kept clean, a few rubs with chamois leather give a bright surface, the bulbous end is of great advantage, combined with the conical form of the instrument. Struck with their value for uterine dilatation, I have had made by Mr. Hawksley a set of bougies which any practitioner can use, and which he will find most

Sizes in Millimeters	
Bulb.	Belly.
8 ..	11
10 ..	13
12 ..	16
13 ..	20
13 ..	23
14 ..	25
14 ..	28
15 ..	30
18 ..	33
20 ..	40
25 ..	53
29 ..	59



Reduced to two-thirds size.—Entire instrument, reduced a little more than half-size.

efficient in dilating the cervix under any of the circumstances above referred to. They will be found to glide easily into the uterine canal, and their ease of introduction is facilitated by the momentum gained from the solid metal. The accompanying woodcut shows five sizes of the bougies. The exact curve is represented. This is nearly similar to the curve of Hegar's dilators, that I have been using, and which I have obtained from M. Kumerle of Freiburg. Trying both forms of dilator on the same patient, and at the same sitting, I can vouch for the less degree of sensitiveness caused by the solid bulbous instrument. Fig. 1 shows in outline the shape and size of one of the smaller ebony dilators of Hegar, No. 9. The advantage of the conical and bulbous extremity over this instrument is, I think, at once apparent. Each of my bougies has stamped on the brass mount the maximum circumference in millimetres of the belly of the bougie. Below are the relative sizes in millimetres of the bulb and belly of each bougie. They are curved to a portion of a circle of twenty-five centimetres in diameter, but this curve can be altered at the will of the operator, as the bougie is quite pliable from the junction of the handle to the point. The same handle can be adapted to each bougie. They can be used through any speculum. The dozen bougies fit into a portable flat case. The belly of the second largest bougie brings the canal up to the calibre of the finger. I have not yet used the three larger sizes of these particular bougies. I have had them made, however, to complete the set. They would be required for exploring the cavity of the uterus. It is rather for the purposes above indicated that I venture to suggest these dilators. I should, perhaps, mention that I have also used from time to time the smaller dilators of Dr. Matthews Duncan. I cannot refrain from quoting the opinion of our eminent gynæcologist when he says: "The treatment by bougies I recommend to you, because it is unaccompanied by danger. The only evil I have ever seen from it is a temporary perimetritis. It is a treatment the innocence of which arises from the fact that there is no cutting, and that the instrument is not left in the womb above a few minutes at a time."

Dr. Priestley's dilators are well known, but they are different in shape and character from those here represented, as are also, as in mode of application, the admirable dilators of Mr. Lawson Tait. I am at present engaged in trying to complete a uterine fixer and tractor, to use for steadying the uterus during simple dilatation and while employing intra-uterine medication, which I hope very shortly to place before the readers of the Lancet.—*Lancet, Feb.* 16, 1884, *p.* 291.

71.—ON THE COMPOSITION OF ERGOT AND ITS USES IN OBSTETRIC PRACTICE.

By R. D. PUREFOY, M.B., T.C.D., Obstetric Surgeon to the Adelaide Hospital, Dublin.

During the past few years ergot has assumed a foremost place amongst the remedies at our disposal for controlling hemorrhage, uterine especially, and as might be expected its composition and the nature of its active principle have engaged the attention of many leading chemists, especially in France and Germany.

Its remarkable effects on the animal economy, at an early date attracted the notice of writers, for in 1096 Sigebert de Grembleur described an epidemic of gangrenous ergotism; and again in 1596 we find notice of a similar epidemic in Hessia. We are indebted for the first account of its medicinal properties to an essay by Desgrange in 1777 and the writings of two American physicians, Stearns and Prescott, about thirty years later. The phenomena induced by large medicinal or toxic doses have been collectively termed ergotism, and from the various writers above named and other sources we gather that two forms of it were observed—the convulsive and gangrenous. In the former, vertigo, numbness of the fingers and toes, tetanoid contractions, beginning in the extremities and extending to the abdominal and thoracic muscles, and abolition of the special senses, preceded death. In the latter, formication, coldness of the surface, nausea, vomiting, and diarrhœa occurred; an eruption of vesicles filled with dark ichorous fluid appeared on the surface and gangrene dry or moist speedily destroyed the toes, legs, nose, and other parts. It is, I think, matter for surprise that effects similar to these have not been recently observed, though in some uterine cases, either by the mouth or hypodermically, it has been beneficially used for months or even years. Two exceptions to this observation deserve to be mentioned. In a recently reported case of uterine fibroid which had been treated by ergotine injections for a considerable time, a post-mortem examination disclosed the fact that the centre of the tumour was in a gangrenous condition, and at the British Pharmaceutical Conference in 1879 Mr. Stoddart, in a most able and interesting paper, described the growth and development of ergot, and drew attention to the occurrence of dry rot, evidently a form of gangrene, in the feet of sheep fed on pasturage containing it. He showed conclusively that ergot attains its greatest medicinal activity in August and September, thus confirming the observations of Kluge, of Berlin, and giving satisfactory reason for the uncertainty in action of many of our present preparations of it; and

further, that in toxicological investigations the microscope is most to be depended on, as the conidia are very abundant and can easily be detected in flour or bread, especially if a little acetic acid be added. It is correctly described in our Pharmacopœia as the sclerotium, compact mycelium, or spawn of the claviceps purpurea, a fungus to the ravages of which all grasses are liable, though most common in the paleæ of the rye, secale cereale (hence one of its old names, secale cereale, spurred rye). Modern research has shown that its physiological action on the system retards the heart's action, causes a great rise in the blood-pressure, attended by contraction of the arterioles, and a special stimulating action on unstriped muscular fibre.

The earliest labours on the composition of ergotine are due to Vauquelin and Legrip in France and Maas and Wiggers in Germany. According to the later researches of Dr. Wigand, Berlin, 1879, and Dr. Daubraiva, 1880, the activity of ergot would be due to 1st. Two acids, sclerotic acid and fasco-sclerotic; 2nd. A bitter alkaloid picrosclerotine; and 3rd. A nitrogenous gummy substance scleromucin.

Ergot contains 1·5 to 4·5 per cent of sclerotic acid, and 2 per cent. of scleromucin. In the second rank come alkaloids of doubtful action: ergotine, ecboline ergotinine, together with sundry colouring matters sclererythin, scleroiodin, scleroxanthin, and sclerocrystallin. In the third rank occur the inert matters: 30 to 35 per cent. of fixed oil, 46 per cent. of cellulose, mycose, leucine, secaline, and ash, rich in phosphates.

Schoonbrodt and Ludwig have found cholesterine in ergot. The "ergotine" of Wiggers, which is the oldest in a chronological point of view, is a complex extractive matter, occurs in the form of a reddish-brown pulverulent extract, insoluble in water and ether, and therefore contains neither sclerotic acid nor scleromucin nor ergotine. For these reasons and its badly defined therapeutic effects it has not been used in medicine.

The "ergotine" of M. Bonjean, of Chambery, is a true mixed extract prepared by exhausting ergot with cold water, and therefore contains probably the sclerotic acid and scleromucin of Dragendorff, the secaline of Winckler, and the ergotine and ecboline of Wenzel.

A third "ergotine" is that of Wenzell, which has the appearance of brownish-black shining varnish, and is very slightly active. Ergotinine is a crystallisable alkaloid, insoluble in water, soluble in alcohol and ether, and forms with acids well crystallised salts. Unfortunately it is very unstable and is found in ergot in very small quantity. Sclerotic acid is obtained like scleromucin from the aqueous extract, is a body with very energetic action, its subcutaneous injection causing paralysis

in frogs. Fusco-sclerotic acid acts specially on the sensibility which it speedily diminishes.

Scleromucin is a viscous colloidal matter, and appears to be the therapeutic agent of ergot.

Picrosclerotine is a very bitter alkaloid and the most toxic agent in ergot, one milligram subcutaneously injected in a frog produces insensibility, paralysis, and death in ten minutes.

However, after going through such a formidable list of active principles, it is satisfactory for those who are much concerned in the daily use of this drug to know that the best authorities agree in declaring that none of the bodies isolated—alkaloid or acid—can replace in therapeutics the drug itself, the medicinal activity of which is due to the whole of its chemical constitution. Consequently, we should, when possible, use the freshly prepared powder. For hypodermic injections we should for the present use the ergotine of Bonjean. In its application to obstetric cases we shall notice first the suggestion made some years ago—I think first by Meadows, of London—to use it with a view of preventing miscarriage. Though I do not think it the best remedy for this purpose, still, it may be used with a fair prospect of success up to the conclusion of the third month of utero-gestation, but after that time its administration is more likely to precipitate than to avert the disaster. When miscarriage is inevitable, we should not use it till the uterus is emptied of its contents: the safety of our patient largely depends on this being done thoroughly, and the early use of ergot will rather hinder than help its accomplishment. During the first stage of labour, at full term, nothing except the occurrence of formidable hemorrhage justifies us in using it—an observation which applies equally to the second stage, at least, till there is every prospect of its speedy termination. The presence of inertia in either stage calls for suitable treatment in each individual case, and in the majority of them we shall effect much more with safety to our patient by the wise use of opiates, stimulants, and nourishment, than by stimulating an already exhausted uterus by repeated doses of ergot.

When given just before birth it is a valuable preventive to hemorrhage, both post-partum and secondary, and helps to prevent undue delay in the third stage. If the placenta be not expelled by natural efforts and moderate pressure within fifteen or twenty minutes after ergot has been given, we should satisfy ourselves by a digital examination as to its position. The necessity for this will be clearly shown by the following case, which occurred in my own practice a few years ago:—Ergot had been given simply as a precaution just before

birth, and finding, after a delay of about twenty minutes, that moderate pressure was not sufficient to expel the placenta, I ascertained by vaginal examination that the uterus had closed on it, the cervix barely admitting the passage of my finger. It is needless to add that I at once passed my hand into the vagina, and after a gradual dilatation of the os with two fingers, easily effected the removal of the uterine contents. When chloroform has been given during labour, the propriety of using ergot before its termination is especially indicated, for thereby we render the occurrence of hemorrhage much less likely. It must be admitted that in some cases of post-partum hemorrhage ergot affords us but little help in establishing that firm and persistent contraction of the uterus on which the patient's safety depends. I believe this is sometimes due to the use of faulty preparations, and sometimes to an idiosyncrasy in our patient. We must remember, too, that when arterial tension has been much lowered by the loss of blood or any other enfeebling agency, absorption by the stomach takes place slowly and imperfectly, and we are much more likely to attain the desired end by hypodermic injection.

With much more confidence, however, we can have recourse to it in the prevention and treatment of the numerous forms of systemic disturbance which retard convalescence during the puerperium. The more closely we observe our cases the more we shall become convinced of the truth of Winckel's observation that most commonly some point in the uterus is the portal through which septic matter invades the system, when it may either be arrested by some localised inflammation, such as pelvic cellulitis, or rapidly diffuse through the circulation, producing the various forms of blood-poisoning. This being so, it will be easily admitted that in a firmly contracted condition of the uterus lies our chief safeguard against such evils. Hence for many years it has been my habit to give the infusion of ergot with sulpho-carbolate or hyposulphite of sodium three or four times daily. Especially is this useful when hemorrhage has occurred, or from any cause the uterine action during labour has been feeble. Again, in metritis the same treatment will speedily remove the pain and tenderness, so that the trouble of frequent poulticing can be avoided.—*Medical Press and Circular, Oct.* 24, 1883, *p.* 349.

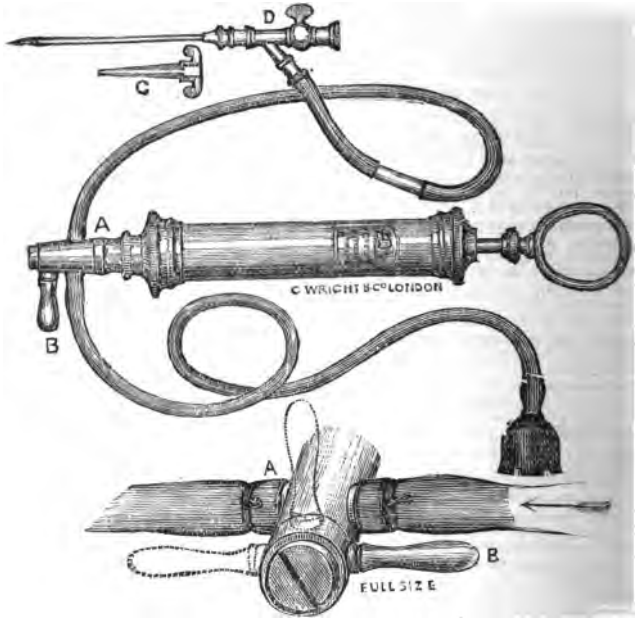
ADDENDA.

72.—IMPROVEMENTS IN SYRINGES.

By R. FITZROY BENHAM, M.R.C.S., Baron's Court, S.W.

Having observed for some time past the great inconvenience and expense one experiences in having to use various forms of syringes for the innumerable purposes for which they are required, both in medical and surgical cases, I have been induced, in consequence, to modify the mechanism of the extremity of the ordinary type of syringe, so that one syringe may be used for numberless different purposes—for instance, whether it be required to wash out an abscess cavity or to syringe a wound, to aspirate the bladder or to perform paracentesis, for the transfusion of fluids, or the injection of an enema, &c. The modification to which I refer will, I have no doubt, be readily understood from the diagrams. A is a hollow T-shaped piece of metal, which is adapted to the ordinary syringe in the place of its nozzle, C. The handle, B, is attached to a coned plug in which there is a rectangular aperture, so that by turning the handle B, either to the left or to the right, the way, so to speak, is opened to either the inlet or the outlet aperture, or *vice versa*, as desired. To the end of each transverse extremity of A a piece of thick rubber tubing is attached, as in the ordinary aspirating or flute-action syringes. To one extremity of the tubing a hollow weight is connected, whilst at the other various attachments may be adjusted. For instance, if the syringe be required for the purpose of washing out a cavity or syringing a wound, the nozzle, C, of the syringe may be connected with the extremity of the flexible tube, and thus fluid may be driven in either direction by simply turning the handle, B, to the left or to the right, at will. Again, if it be required to perform paracentesis, or to aspirate the bladder, the nozzle, C, may be replaced by an ordinary canula and trocar, D, as shown in the diagram. Thus it may be seen that by simply applying various attachments to the extremities of the tubing any ordinary syringe may be at once adapted for the various purposes. Apart from the advantages to be obtained as above described, by simply applying this modification or addition A to an ordinary syringe, it may be mentioned: 1st. That the direction of the inlet or the outlet being in a line, instead of rectangular, as in the case of the ordinary stomach pump with its flute action mechanism, it is impossible for one aperture to be opened before the other is completely closed, notwithstanding they may be of considerable size. 2nd. No matter how small the extremity of the nozzle, C, may be, it does not impede the flow of the fluid

when the syringe is being refilled—a point, I venture to think, of considerable moment where a large quantity of fluid is required, as in the case of syringing a wound after operation.



thus saving time and the annoyance of unscrewing or detaching the nozzle from the extremity of the syringe before refilling the latter. 3rd. When the nozzle of the syringe is once *in situ* it may be allowed to remain so until it is no longer required, whereas with the ordinary syringe it must be replaced every time it is refilled. 4th. As there are no valves or complicated mechanism the working parts cannot possibly get out of order or become corroded. 5th. The attachments, A, may be applied to all existing syringes by simply causing the size of its screw to be made to correspond with the nozzle, while other portions, such as a cannula and trocar, may be adapted at will. In conclusion I may state, for the information of the profession, that Messrs. C. Wright and Co., of 108, New Bond Street, London, have in stock various sizes of the attachments as above described, and that on their receiving an ordinary syringe they will adapt them accordingly.—*Lancet, Feb.* 16.

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TO

BRAITHWAITE'S

RETROSPECT OF MEDICINE,

1881—1883.

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